THE ARCHITECTURAL FORUM

NOVEMBER

1922

A post card brings you a copy of this bond

Why make a big problem of a concrete floor?

Hard-n-tyte for **CONCRETE** and **MORTARS**
REG. U.S. PAT. OFF.

For over twenty years the General Chemical Company has been at the forefront of chemical research and manufacture in this country. The Hard-n-tyte Specification is the latest contribution of its splendid staff of chemists. It is the successful result of long search for a concrete floor hardener that *really hardens* the floor and *materially increases* its life. It enables engineers and architects to give their clients a quality of concrete work far in advance of anything that has been possible heretofore.

THE average man might take a month or so to decide upon what floor hardener to use on the concrete floors of a building like "290 Park Avenue," New York.

But, to trained business men the matter settles itself immediately. The 5-Year Guaranty Bond is the first thing the business man sees, and he exclaims:

"Enough!"

His second thought is that chemists and concrete specialists must have proved the sureness with which floors are hardened when treated with Hard-n-tyte. They must have proved the long life—much more than 5 years—before the U. S. Fidelity & Guaranty Company ever agreed to issue a 5-Year Guaranty Bond insuring every Hard-n-tyte Specification Floor.

That is exactly right! All these things *were* settled. And because of that every concrete floor you lay will be insured. Every dollar the building owner spends for Hard-n-tyte is protected by a 5-Year Guaranty Bond, if you put down Hard-n-tyte Specification Floors.

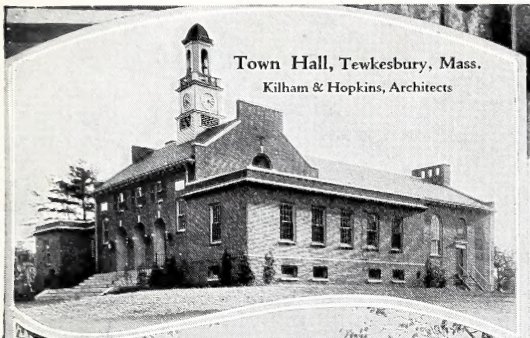
Drop us a post card asking for a copy of the Hard-n-tyte Specification and a sample bond.

General Chemical Company
40 Rector Street New York City

The building illustrated above is 290 Park Ave., New York.
WARREN & WETMORE, *Architects*
FRED T. LEY & CO., *General Contractors*
GENERAL FLOOR MAINTENANCE CO., *Contractors for Application of Hard-n-tyte.*

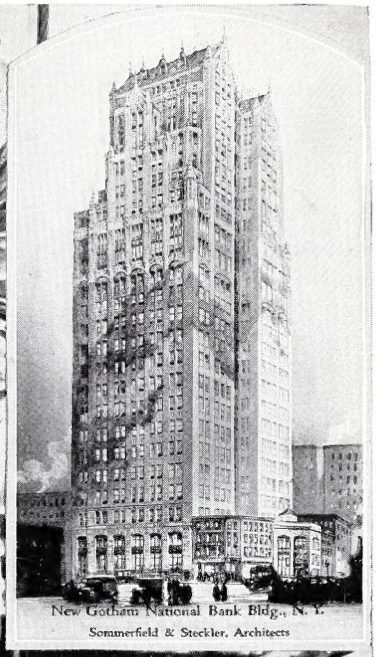
Hard-n-tyte Specification Floors

—dustless, long-wearing concrete



Town Hall, Tewkesbury, Mass.
Kilham & Hopkins, Architects

Hospital, Hackensack, N. J.
Crow, Lewis & Wick, Architects



New Gotham National Bank Bldg., N. Y.
Sommerfield & Steckler, Architects

Save 1/3

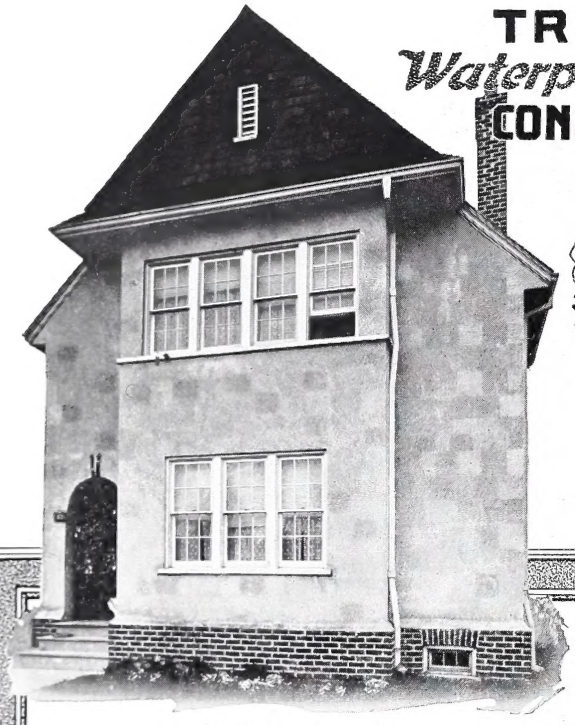
of the labor, dead load and mortar in the next building you erect by using Natco Header Backer Tile with a veneer of face brick. The saving in structural steel runs into tons and foundation costs are materially decreased. The elimination of through mortar joints insures dry interior walls. These savings have already been made and time of erection cut down on hundreds of the finest structures from office buildings to residences.

Write us for data on this new form of construction with list of buildings, architects, contractors, etc.

National Fire Proofing Co.
Fulton Building, Pittsburgh, Pa.

NATCO HEADER-BACKER TILE

TRUSCON
Waterproofing Paste
CONCENTRATED



No Waterproofing used in this Stucco

Waterproofing *was* used in this Stucco

WHY THE MOTTLED STUCCO?
OF THE HOUSE ON THE LEFT

THE house at the left is an instance of what may happen when waterproofing is not used in stucco. Difference of absorption of various sections of the wall underlying the stucco, and the normal porosity of the stucco itself, may sometimes result in a checkered appearance.

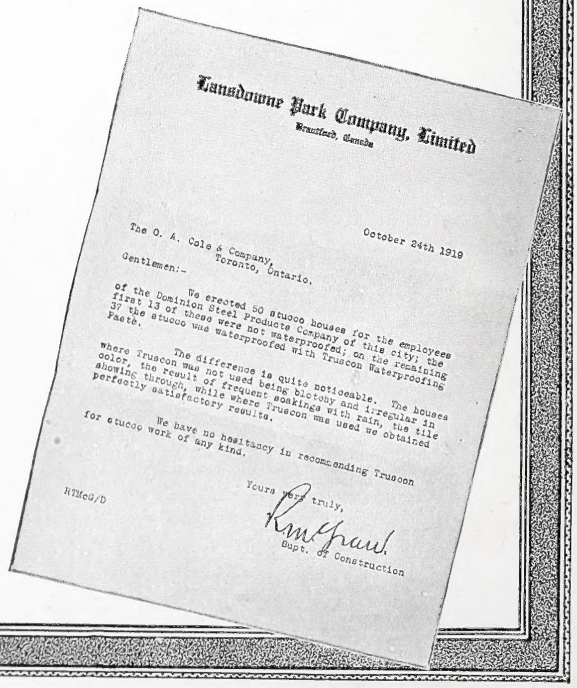
Cement stucco is a beautiful form of construction; it is attractive and durable—but like all masonry, stucco should be waterproofed. Because stucco is porous. Even a concrete wall is porous and absorbs water—how much more permeable to water must a thin shell of stucco be?

We were unusually fortunate in being able to obtain these two pictures of stucco construction from the Lansdowne Park Company, Brantford, Ont. It just happened that the first 13 houses which they built on a contract of 50 were finished with unwaterproofed stucco. The house at the left, with its mottled appearance, is an example. The house at the right is representative of the remaining 37, which were waterproofed with Truscon Waterproofing Paste, *Concentrated.*

Truscon Waterproofing Paste has other advantages besides that of waterproofing. It makes a rich, creamy stucco which is very satisfactory to apply. It kills absorption, producing an even textured stucco. It keeps water out of the surface and prevents hair-checks, mottling and serious stucco discolorations.

Should you be interested in the subject of waterproofed stucco, we will gladly send you specifications. Ask for "Science and Practice of Integral Waterproofing".

Facsimile of letter from the Lansdowne Park Company, Ltd., Brantford, Ont., on the advantages of Waterproofing in Cement Stucco



Lansdowne Park Company, Limited
Brantford, Canada

October 24th 1919

The O. A. Cole & Company,
Toronto, Ontario.

Gentlemen:-

We erected 50 stucco houses for the employees of the Dominion Steel Products Company of this city, the first 13 of these were not waterproofed; on the remaining 37 the stucco was waterproofed with Truscon Waterproofing Paste.

The difference is quite noticeable. The houses where Truscon was not used being blotchy and irregular in color, the result of frequent soakings with rain, the tile showing through, while where Truscon was used we obtained perfectly satisfactory results.

We have no hesitancy in recommending Truscon for stucco work of any kind.

Yours very truly,

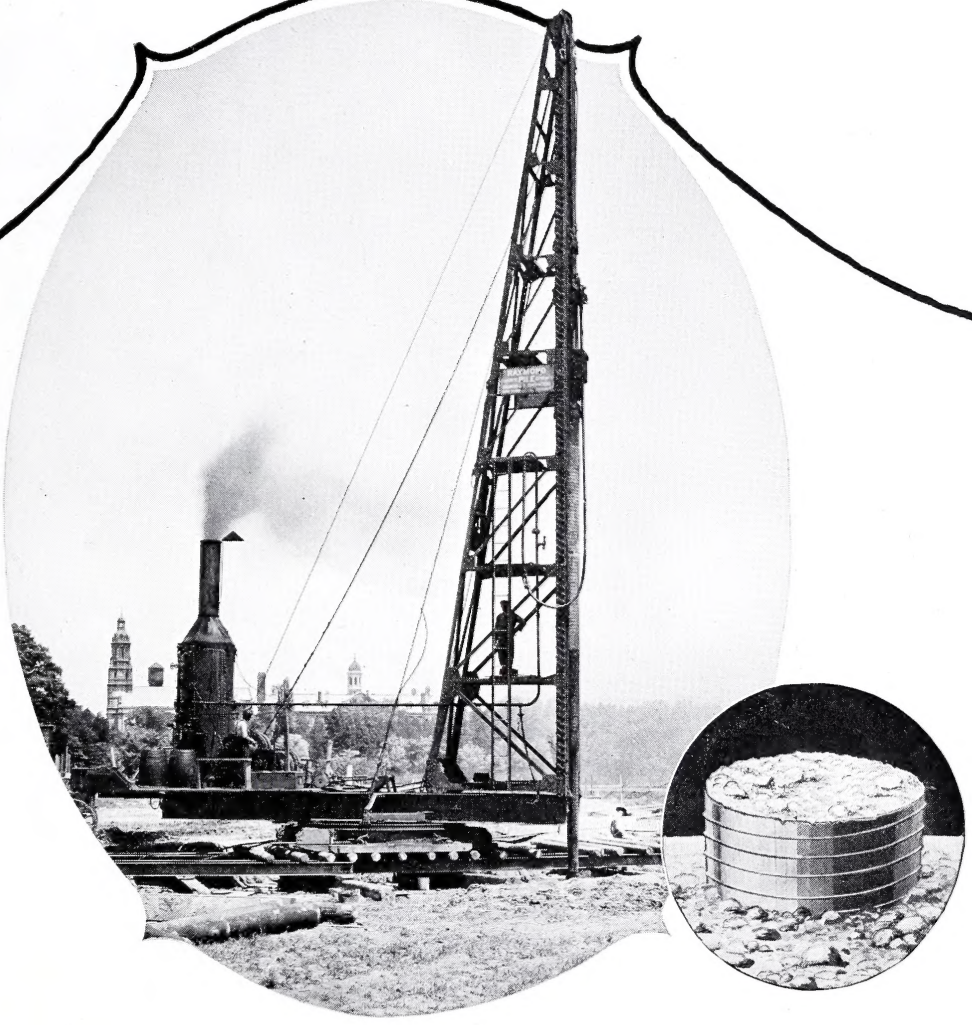
NTMcd/D

Supt. of Construction

THE TRUSCON LABORATORIES

The World's Largest Manufacturers of Integral Waterproofings

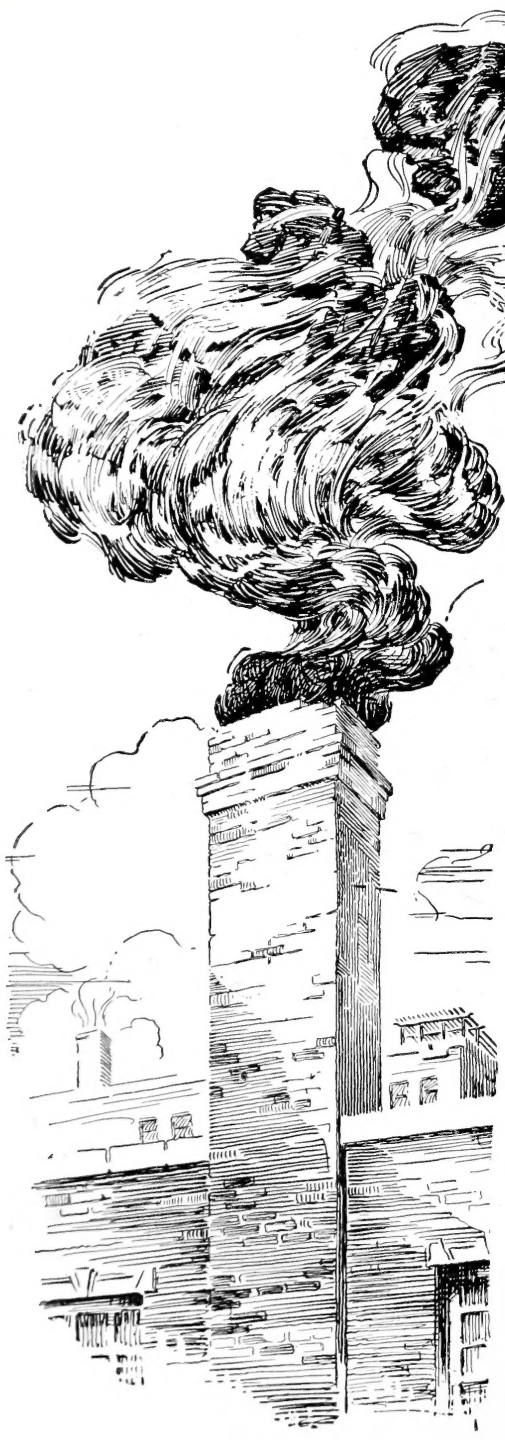
DETROIT, MICHIGAN



We repeat—Every Raymond Concrete Pile is cast in place in a spirally reinforced steel shell and this shell is left in the ground—think it over

RAYMOND CONCRETE PILE COMPANY
New York: 140 Cedar Street
Chicago: 111 West Monroe Street
Montreal, Canada: Raymond Pile Co., Ltd.
A Form for Every Pile—A Pile for Every Purpose

RAYMOND



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A Kewanee Smokeless Boiler burns *all* its coal—hence none of it is wasted up the stack as smoke. The man who pays the coal bill appreciates the saving—usually it is a big one.

Furthermore, Kewanee Smokeless Boilers have "burned" their way into the hearts of owners by their ability to burn *any* coal. Your reputation is safe when you specify and install a Kewanee.

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NEW YORK	47 W. 42nd St.	PITTSBURGH	945 Oliver Bldg.
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KANSAS CITY	2014 Wyandotte St.	DALLAS	809 Southwestern Life Bldg.
INDIANAPOLIS	509-10 Occidental Bldg.	DETROIT	1772 Lafayette Blvd.
ST. LOUIS	1212 Chemical Bldg.	TOLEDO	1121-22 Nicholas Bldg.
MINNEAPOLIS	708 Builders Exchange	CLEVELAND	706 Rose Bldg.
COLUMBUS	808 First Nat'l Bank Bldg.	ATLANTA	1524-25 Candler Bldg.
SALT LAKE CITY	204 Dooly Bldg.	SAN FRANCISCO	72 Fremont St.

CANADIAN REPRESENTATIVES—The Dominion Radiator Co., Ltd.

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KEWANEE

The Century Club, New York City. McKim, Mead & White, Architects. Terra Cotta used for wall finish of lower story above base and ornamental treatment up to and including parapet balustrade.

GOOD ARCHITECTURE, GOOD MATERIAL

Good architecture implies careful selection of good material. Consistency in this respect characterizes the work of leading architects.

For 33 years the Century Club has stood as among the finest achievements of McKim, Mead & White. It not only shows a fitting selection of Terra Cotta but illustrates its absolute durability when intelligently incorporated with good construction.

Let us assist you in correctly detailing for this result. Address **National Terra Cotta Society,** 19 West 44th Street, New York, N. Y.

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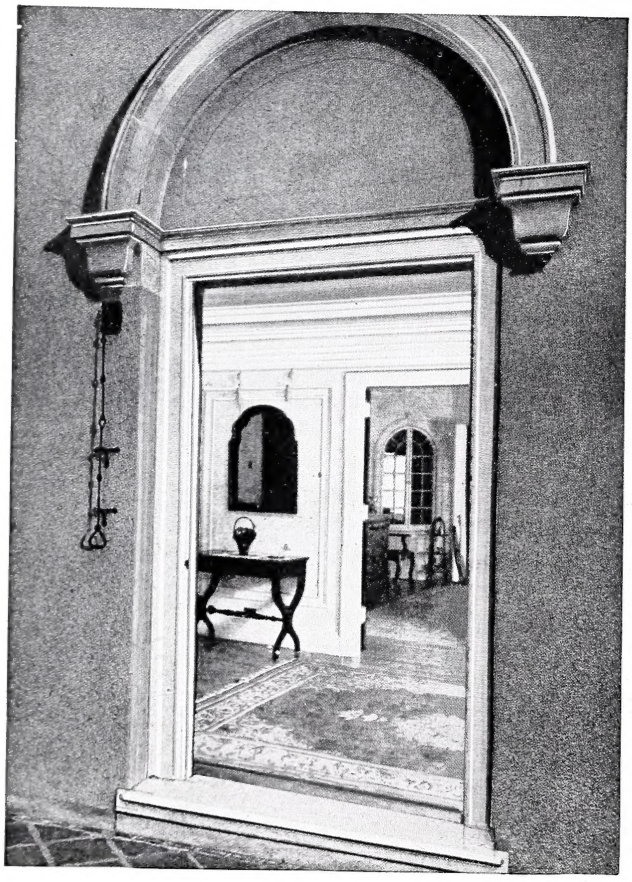
Permanent *Beautiful* *Profitable*



The Home that stays beautiful

ENDURING beauty in a home is the result of forethought. If a house has been thoughtfully planned with a direct view to permanence, it preserves its charm of interior and exterior indefinitely.

One of the most distressing disfigurements that a house can suffer is in the plaster and its decorations, where unsightly cracks too often mar the surface. It is then almost impossible to restore the original beauty of the walls and ceiling.

The only remedy is prevention. The use of metal lath is very effective in maintaining the original appearance of the home. In the interior, it prevents cracks, stops fire and saves in cost of repairs and redecoration. The use of stucco on metal lath for the exterior gives the most economical, fire-resistive construction, requires no painting and saves in up-keep.

TRUSCON METAL LATHS are efficient and economical to use. Furnished in a variety of types, they meet every requirement. Wide spacing of studs and channels permits saving in material and labor. TRUSCON METAL LATHS mean permanence and economy.

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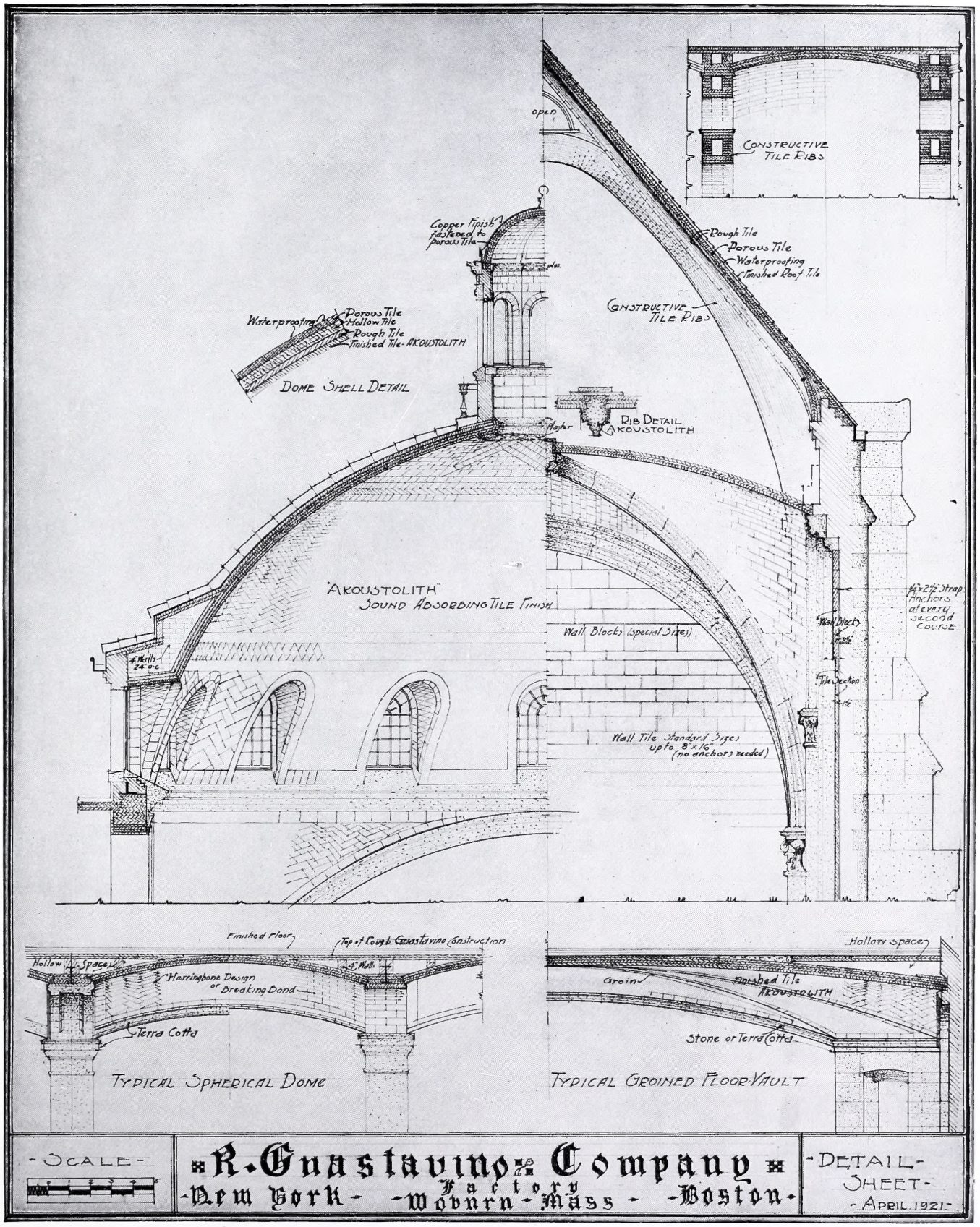
Warehouses and Representatives in Principal Cities


open
Constructive Tile Ribs
Copper Finish fastened to porous Tile
Rough Tile
Porous Tile
Waterproofing
Finished Roof Tile
Waterproofing
Porous Tile
Hollow Tile
Rough Tile
Finished Tile - Akoustolith
Dome Shell Detail
Constructive Tile Ribs
Haylar
Rib Detail Akoustolith
"Akoustolith" Sound Absorbing Tile Finish
Wall Blocks (special Sizes)
4" Walls 24" o.c.
4½x2½ Strap Anchors at every second Course
Wall Blocks
Tile Section
Wall Tile Standard Sizes up to 8"x16" (no anchors needed)
Finished Floor
Top of Rough Guastavino Construction
Hollow Space
4" Walls
Herringbone Design or Breaking Bond
Terra Cotta
Typical Spherical Dome
Hollow Space
Groin
Finished Tile Akoustolith
Stone or Terra Cotta
Typical Groined Floor Vault
Scale
R. Guastavino Company
Factory
New York - Woburn - Mass - Boston
Detail Sheet
April 1921

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Theaters demand an architectural treatment that expresses their purpose. Color, modeling and attractive ornament are distinctly an asset and a necessity. These features can be had at moderate cost in only one material,

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Technical and design facilities at our plant insure faithful execution of your specifications.

Motion Picture Theater, Philadelphia, Pa.
Stuckert & Sloan, *Architects*
Terra Cotta in cream glaze with a black splatter

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Tints of Color Hold the Future of Architecture

Our material furnishes them in acceptable, lasting and cleanly form

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Chicago, Ill.

The tower of the Schiller Building, Chicago, originally named the German Opera House. The auditorium is now used as the Garrick Theatre. Built 1891,—thirty-one years ago; Adler and Sullivan (Louis H.), Architects.

The entire facing and trim is unglazed Northwestern terra cotta of light gray color. The fine enrichment of the tower is surpassed in the exquisite detail of the lower stories, to be illustrated at a later date.

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CHICAGO

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THE installation of Fairfacts China Accessories in bathroom walls is rapidly becoming standard practice not only in the construction of the finest residences, hotels and apartment houses, but in less pretentious homes as well.

It is not conceivable that anyone who has enjoyed their convenience would willingly go back to old-fashioned portable fixtures.

Because Fairfacts Accessories are made of china, they are easily cleaned. They will not crack or check and are free from danger of stains. These accessories cover every need of the modern bathroom — Soap Holders, Towel Racks, Paper Holders, Tooth Brush and Tumbler Holders, Shelves and Electric Radiators.

Architects' Service Department

WE ARE glad to cooperate with architects in furnishing construction details as well as to suggest the most convenient arrangement in the placing of these accessories.

Fairfacts Fixtures are installed by tile contractors—the only trade that does this work and should be included in the tile contract. We do not sell the plumbing trade.

THE FAIRFACTS COMPANY, *Inc.*
Manufacturers
234 West 14th Street New York City

Fairfacts Fixtures
BUILT IN YOUR BATHROOM WALLS

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A Helpful Reference Book

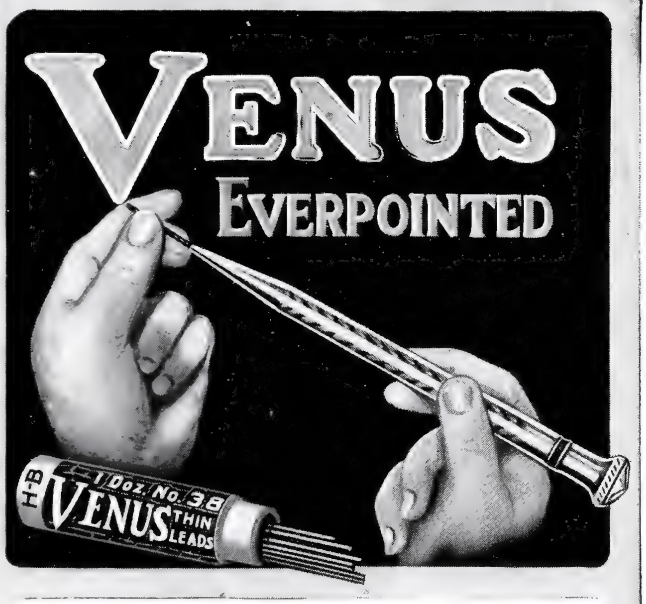
THIS publication is one which many architects have found of considerable practical value as a reference book. It supplies accurate and essential facts based upon collective experience and an extensive study of all aspects of swimming pool construction.

The standard designs and details presented in this book have formed the basis for designs adopted by a number of official and private organizations.

Among others, the California State Board of Health prepared many of its regulations and recommendations upon the principles set forth, and incorporated parts of the text, plans and illustrations in its own publications.

This book also serves as a text book in a number of colleges and architectural schools. If it is not in your library, a copy will be sent on request without charge.

THE ASSOCIATED
TILE MANUFACTURERS
Beaver Falls, Pa.



THE superlative quality of VENUS Drawing Pencils is admitted by all.

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17 black degrees—and 3 copying

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The cabinet holds 500 interfolded sheets and serves *just two at a time.*

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Department F
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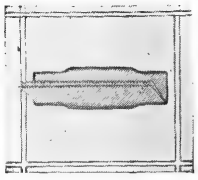
KNOWLEDGE QUALITY SERVICE
RICE LEADERS OF THE WORLD ASSOCIATE

NEW YORK, U.S.A.



No Bathroom Is Complete

Without a

Hess White Steel Medicine Cabinet

***or* Lavatory Mirror**

Five sizes to recess or to hang on the wall

Shaft Mirror Doors and Cabinets also

This mark guarantees HESS TRADE-MARK CHICAGO *best quality throughout*

Sold by Jobbers and Dealers everywhere

Hess Warming & Ventilating Co.
1216 Tacoma Building, Chicago
Sweet's Index, page 1638
Makers also of Hess Welded Steel Furnaces

Park Avenue Baptist Church, New York City. Associated Architects: Henry C. Pelion, Allen & Collins; Contractor: Marc Eidlitz & Son, Inc. 6100 sq. ft. of 30-inch extra dense nailing Pyrobar Roof Tile used.

USG PYROBAR ROOF TILE

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Pyrobar tile are ideal for churches, schools, hospitals and other public buildings. They are light and require a minimum of supporting steel. They are easily erected and are fireproof and permanent. Ornamental tile or slate can be nailed directly to Pyrobar.

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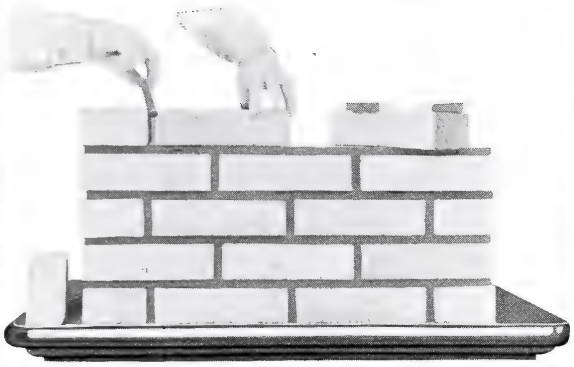
Clinton Mortar Colors



To All Architects

SOME months ago we offered this ingenious Mortar Color Experimenter to a limited number of architects in New York State. The response was gratifying—the letter given below is typical of many received. The Experimenter is very easy to use and gives the exact effect of each color combination. These can be tried until both architect and client are completely satisfied.

We believe that many architects will find it valuable. We will gladly send it on request, without charge.

GEORGE O. BARNES
ARCHITECT
GREAT NECK, L. I.

March 27, 1922

Clinton Metallic Paint Co.
Clinton, N.Y.

Dear Sirs:-

Your mortar color strips received for which please accept my profuse thanks.

I did not expect anything so wonderfully convenient. I had an idea I would have to lay up a panel of brick in mortar with raked joints and insert 3/8" cardboard strips, colored on one side, which you would supply, so you can see how agreeably surprised I was with what you sent me.

Again thanking you, I am,

Very truly yours,

Geo. O. Barnes

The Clinton Metallic Paint Co.
Clinton, N. Y. *Dealers everywhere*

Nature's Permanent Colors. Made since 1887

Established 1856

HENRY MAURER & SON

MANUFACTURERS OF

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OF EVERY DESCRIPTION

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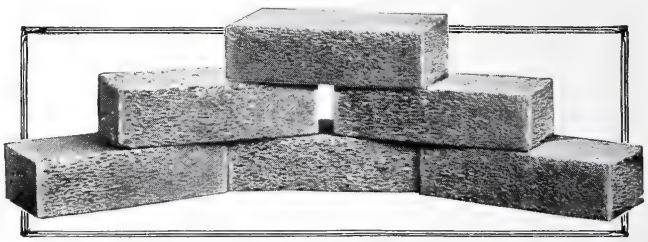
Penna Building

Works: Maurer, New Jersey



Correctness in Brick

Specify These Brick

Doric Stippled Brick

The Dorics offer six unusual shades of buffs and tans, from a delicate buff with a pinkish cast, through olive buffs, golden tans and rich browns, to deep purplish browns and blacks.

Gothic Stippled Brick

The Gothics offer beautiful tones of rich browns and reds, ranging from dark brown or black, through light browns and reds to a wonderful old rose shade.

Write Department 111 for Stippled Brick Booklet

WITH brick, as with clothing, there are correct and incorrect styles. Some brick are plain, flat and smooth. They are like plain ultra-conservative clothing. They have no life—no character. They are uninteresting and tiring.

Others are unusually rough and fanciful—like freakish garments—adaptable only to a few specialized uses, and then often of temporary popularity. They collect dust which the rain distributes over the wall, causing stains.

Stippled Brick might be compared with "correct" apparel. Their texture is lively, interesting, original. One never tires of them. They diffuse light rays gently, and bring out the beautiful soft colors of the brick. You will be proud of your Stippled Brick buildings.

STIPPLED BRICK

Western Brick Company
Capacity One Hundred Million Annually
Danville, Illinois

A·F·B·A
USE FACE BRICK
—it Pays

Wing of Public Library, Waltham, Mass. Joseph Leland, Architect

There is distinctive character in this design, as there is in the durable brick and the English Bond in which it is carried out. A century from now this building will have the added mellowness of tradition and age, with its usefulness unimpaired.

Advance in Artistic Brickwork

A COMPARISON of present day brickwork with that of a generation ago shows a remarkable advance in the handling of this plastic material. The greater skill on the part of designers in the use of bonds, pattern work, mortar colors and the color ranges in the material itself is, in all parts of the country, producing beautiful structures. Many architects have learned that artistic effects in brickwork are not dependent on special sizes or molded forms, but that they can be economically obtained by the use of standard size Face Brick.

More than a hundred examples of the artistic possibilities of standard size Face Brick are shown in The Portfolio of Architectural Detail in Brickwork. The de luxe half-tone plates comprising the series are assembled in three series, each in an enclosed folder, with printed tab, ready for filing. A set of these folders will be sent to any architect requesting them on his office stationery.

AMERICAN FACE BRICK ASSOCIATION

1751 PEOPLES LIFE BUILDING · CHICAGO, ILLINOIS

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SAMPLES DISPLAYED WITH ARCHITECTS' DRAWINGS NEW YORK CITY

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Number Fifteen

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Architect, Kenneth M. Murchison, New York City

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Please consider the Service Department of the Appalachian Marble Company as part of your own organization and use its services accordingly.

APPALACHIAN MARBLE COMPANY

KNOXVILLE - TENNESSEE

QUALITY - - - - - - - - - - SERVICE

The Leeds Memorial, Woodlawn Cemetery, New York
John Russell Pope, Architect

JUST as the immortal symphonies of Beethoven receive adequate rendition only by the finest orchestras, so the idealism embodied in a memorial design of character can only be expressed in the finished product by those who have devoted their lives to the fashioning of monuments. Harrison service will meet your every requirement.

Write for Booklet "D"

HARRISON GRANITE CO., Inc.
Established 1845
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857 Fine Arts Building, Chicago
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1501 Kresge Building, Detroit
Works, Barre, Vermont

HARRISON MEMORIALS

M. J. P. Cahill Residence
Greenwich, Conn.

F. P. Whiting
Architect

TUDOR Stone Roof, gray walls and flagstone terrace combine to give this home that matured appearance which is so desirable.

Write for copy of our new "Architectural Leaflet" giving detailed specifications and information.

Tudor Stone Roofs

Rising and Nelson Slate Company

Since 1869 Miners and Makers of High-grade Roofing Slates

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Architects' Service Department, 101 Park Avenue, New York

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Scottish Rite Masonic Temple, Guthrie, Oklahoma. Architects: Messrs. Hawk and Parr, Oklahoma City, Okla. Contractor: James Stewart. Bedford Limestone furnished by J. Hoadley & Sons, Guthrie, and set by John McBeath & Son.

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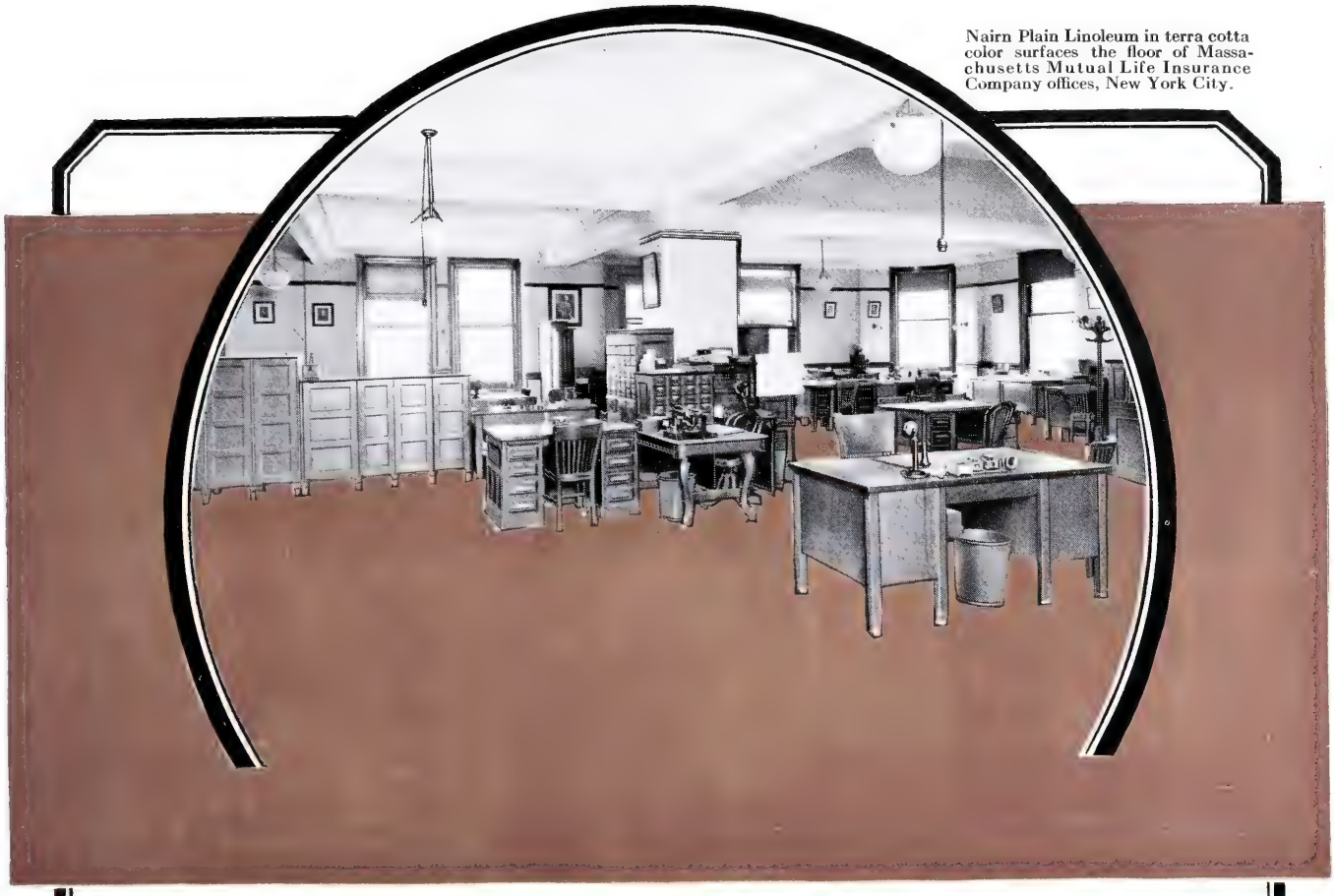

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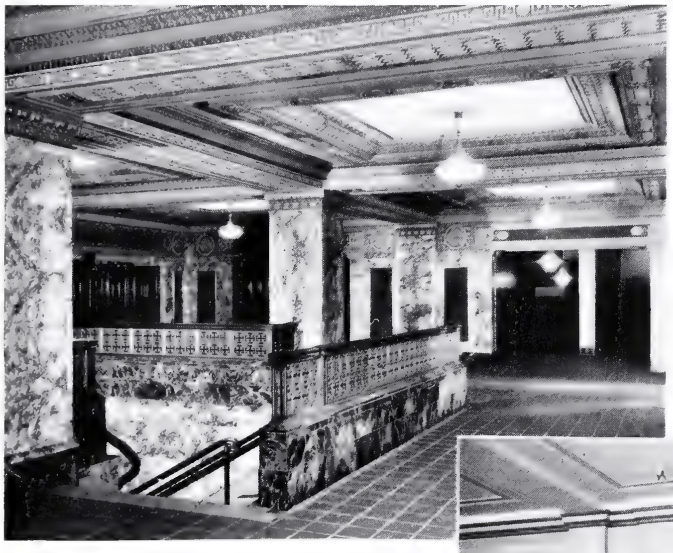

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J. H. MacDowell, Architect

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This illustration suggests the possibilities of Linotile floors in rooms of large area. This attractive floor is made up of twelve-inch squares of black and white Linotile with black border. Colonnade Cafeteria, Cleveland, Ohio

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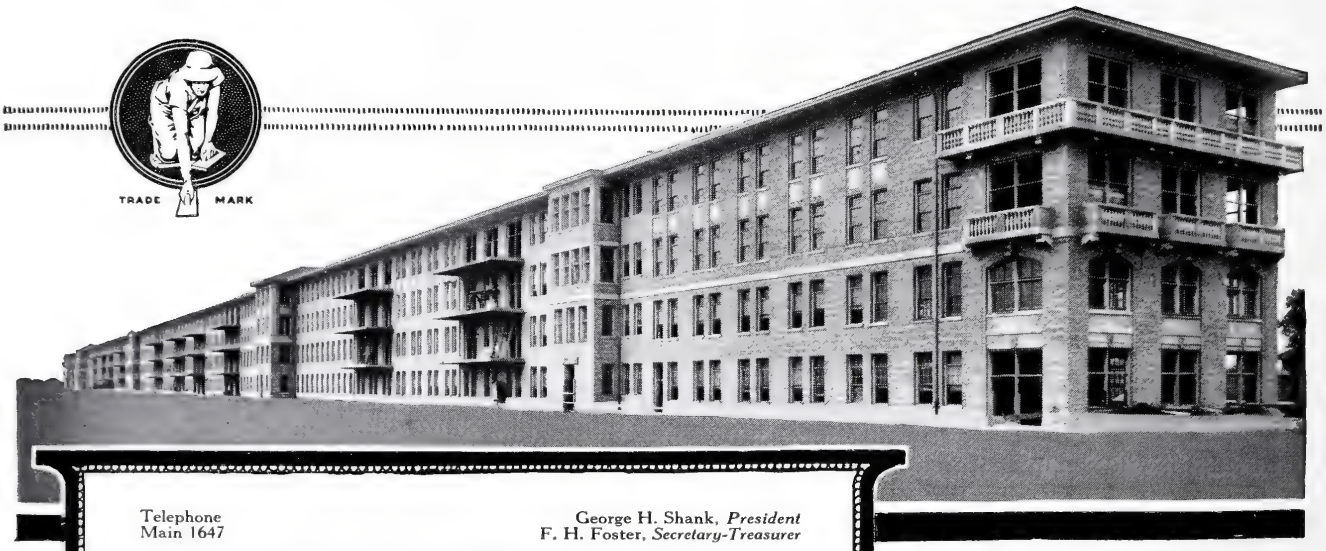

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The Master Builders Co., Cleveland, Ohio.

Re: Edward Hines, Jr., Memorial Hospital, Maywood, Ill.

Gentlemen:

Your letter regarding our experience in the use of your product, MASTER MIX, for the above job, we take pleasure in answering.

MASTER MIX was adopted for all the floors in this building which are cement finish, after a thorough investigation of all the various products offered in competition.

We are not sorry for our selection and your claims were all verified and even more so.

The topping was applied on a set slab, and we not only used MASTER MIX in the top finish, but followed your directions and used it as a bonding coat and it proved its value in this respect. We had but a few hundred square feet that was not bonded, over an area of 600,000 square feet where we found that failure was caused by the slab not being cleaned of plaster that had fallen before topping was applied.

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We are glad to lend a good word for the advancement of your product. If you could carry these floors around as a sample, you would sell every prospect.

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By GEORGE H. SHANK, *President*

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For specifications see pages 202, 203, 7th Edition, Sweet's Engineering Catalog, and pages 104, 105, 17th Architectural Edition.

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BOOK DEPARTMENT

A GUIDE TO ENGLISH GOTHIC ARCHITECTURE. By S. Gardner. 56 drawings in the text and 180 photographs. 6 x 10 ins. Price $5.25. The Macmillan Co., New York.

THE genius of the centuries of the later middle ages, from the eleventh to the fourteenth, worked the development of a different form of Gothic architecture for each country into which the use of Gothic forms had been carried. Even within the borders of a single land there might be many and subtle variations of design and mannerisms of construction, uses emanating from the chief cities of different provinces. France saw the development of many such schools, the Gothic of the Ile de France differing considerably from that of Burgundy, Anjou or Champagne, even during the period when Gothic architecture was at its height and when builders were diffusing the knowledge and making common property the achievements which experience had given them.

Different by far from the history of Gothic in France is its story in England. The conquest of England by the Normans, toward the end of the eleventh century, brought into England the manner of building which even then prevailed in Normandy, developed by that hardy race which had invaded northern France as barbarians, the destroyers of churches, murderers of priests and the ravagers of convents, but which within one brief century had not only embraced Christianity and the arts of peace but had absorbed the architectural knowledge of the conquered territory and were building in many parts of Europe the beautiful forms which we know as Norman. The same builders were to carry to England the Gothic architecture of France, and Normandy sent across the channel the best of her sons to be master craftsmen as well as bishops and nobles.

The Deanery, Winchester
From "A Guide to English Gothic Architecture"

In this work there are contained illustrations and descriptions of many of the religious structures built in England which stand as examples of the architecture of the late Norman and Gothic periods. The use of transitional forms and of the early English, decorated and perpendicular Gothic types, is made clear and definite and aids the student in gathering a clear idea of the history of this great movement which was destined to cover all Europe with a white mantle of churches. Because the building of its Gothic forms is so clearly the reflection of the temperament of a race it is important that the student recognize the points of divergence between the plans of the great cathedrals of France—Paris, Rheims, Chartres and Amiens—and the great structures which mark the culmination of English Gothic—the substitution for the apse and the *chevet*, made up of its encircling ambulatory and radiating chapels, of the square end with its great window which filled the entire east end of the sanctuary, and differences of design, such as the tendency of the French to use vast window spaces, thus diminishing the proportion of solid wall which was

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more customary in England. Then, too, the English cathedrals were situated differently from those of France, and were almost invariably built where much surrounding area gives opportunity for the emphasis of its architectural dignity; almost always the spacious area of close and other domain sets the cathedral apart from its town, as at Salisbury or Litchfield, or else its towers may dominate a height, as at Durham, in any case securing an opportunity for expression which could never be had by a French cathedral, intimate part and parcel of a town's life and so closely built around with domestic structures, as at Amiens or Rheims, that it is often impossible to secure an adequate view of the cathedral itself.

The method in which the work is arranged adapts it to the student's use, for it is planned according to subjects with the illustrations placed in chronological order. These illustrations include general interiors, spires, towers, porches, windows and doors, and numerous details of sculpture, such as capitals, foliage, bosses, corbels and figure subjects of different kinds.

Notwithstanding the number of works being published on the subject of Gothic it is not always easy for the student to obtain a really firm grasp upon its meaning, and particularly welcome is a work which renders more easily understood the theory and practice of architecture's supreme achievement.

HET MODERNE LANDHUIS IN NEDERLAND. By J. H. W. Leliman and K. Sluyterman. 236 pp., 8½ x 11½ ins., bound in cloth. Martinus Nijhoff, The Hague, Holland.

THE modern suburban or country house in Holland has undergone the transformation which has attended its development in every country, and this well printed and fully illustrated volume sets forth the result. With the well defined traditional domestic architecture of Holland as a foundation, the modern Dutch architects have evidently not been slow to adapt to their problems whatever in the architecture of other countries fitted in with their needs, and many of these well designed homes suggest that Holland as well as America has felt the influence of what is sometimes known as the "modern English" style, while certain others might almost have been photographed in the suburbs of Boston or New York.

An interesting characteristic of the greater number of these houses, almost all in country or suburbs, is the prevalence of brick as a building material, to be expected no doubt in a country where forests are but rare while brick has been in use for centuries. The illustrations prove that the Dutch have not lost their ancient skill in the use of brick and in its combination in pleasing manner with wood, tiles, stucco and the other materials which are combined with brick in other lands. An interesting detail of many of the illustrations is the use which they show of roofing materials—tile for the most part, though many houses are roofed with what closely resembles old fashioned thatch, which adds that touch of quaintness which Americans are apt to associate with the Netherlands. The floor plans of the various houses which are included show an arrangement not greatly different from what would be found in America, the chief difference being perhaps the apparent tendency toward planning a number of small rooms in the area wherein America but one or two larger rooms would be preferred.

ARCHITECTURAL DRAWING. By Wooster Bard Field, Architect. 9 x 12 ins., 161 pp. Price $4. McGraw-Hill Book Co., Inc., New York.

EVEN the most skilled of draftsmen is apt to consider his knowledge incomplete. The technique of architectural drawing is so large in extent and in many of its phases so complicated in detail that the proper grasping of the subject may well occupy years of study, application and practice. To obtain a good working knowledge of the art many volumes of text and countless expensive plates would be required, since almost without exception these books and portfolios of plates each deal with but a single aspect of the subject and go into that at considerable length, which makes it necessary that the student have access to a well equipped library or else invest in a variety of more or less expensive works.

In this volume, prepared by the Assistant Professor of Engineering Drawing at the Ohio State University, an attempt has been made to provide for the student those things which might be regarded as the fundamentals of the initial stage of the subject, as well as a careful presentation of certain of the more important points which are not generally covered in the work of the schools, but left to be acquired by actual practice after the student has left school. The subjects covered are taken up in the order in which they are naturally presented at the drawing board, which would seem to be a logical and natural method of presenting them, since this sequence would also give the reader a comprehensive and well-ordered grasp of the entire process. First there is an explanation of the method of orthographic projection and its application to architectural drawing; this includes the relation of views, auxiliary projections, sections, developed views and intersections. Next in order there is a description of the instruments commonly used in drawing and consideration of the geometric solutions most employed by architects. The subjects of preliminary sketches, scale and detail drawing and the orders of architecture are then taken up. While upon the subject of scale drawings examples are given of typical drawings which show buildings of different materials and various methods of construction to present to the student the methods by which certain well known architects actually portray such buildings, knowledge of which is of value to draftsmen.

As a guide to the student a suggested course of study has been added, presented in view of the author's wide experience as a professor of engineering drawing. This course is made up in such a way as to serve as an outline for either a simple or a comprehensive program of study, and it gives the student a methodical order of procedure while making it optional with him as to the extent of his work in each of the departments concerned. The work deals primarily with architectural drawing, but suggestions are made for wider study in both architectural design and engineering. For most students an important subject during earlier days is lettering as applied to architectural work, and this subject has been treated at some length by Prof. Thomas E. French, also of the Ohio State University.

A work of this kind would be quite naturally intended primarily for the use of students of architecture, but it will be found invaluable as well to anyone concerned in any way with architectural work.

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A volume on the small country or suburban houses and town houses, detached or in rows, of the late eighteenth century type, suitable for American use today. The houses shown include those of stone, brick, stucco or clapboards and most of them are designed in the dignified, slightly formal style which marks the Georgian period; some of the buildings contain shops on the ground floors with living quarters above. The volume also contains illustrations of doorways, porticoes, balconies and wrought ironwork of the time.

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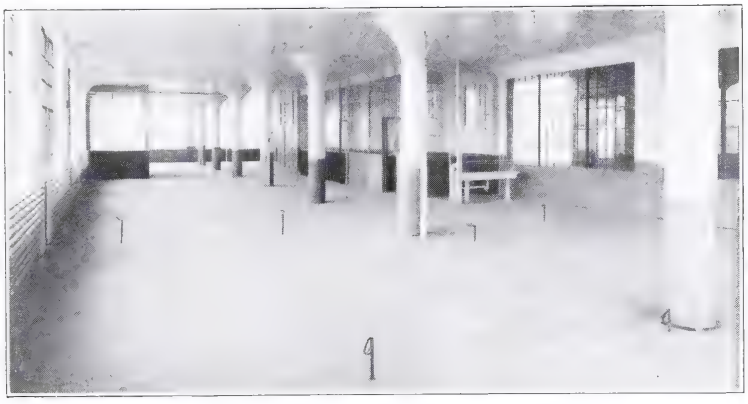

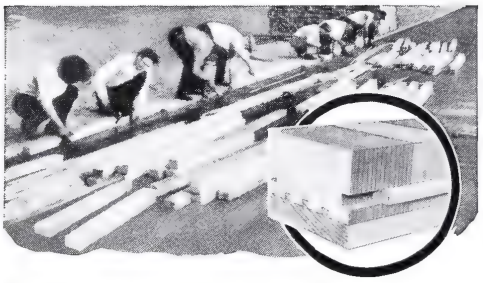

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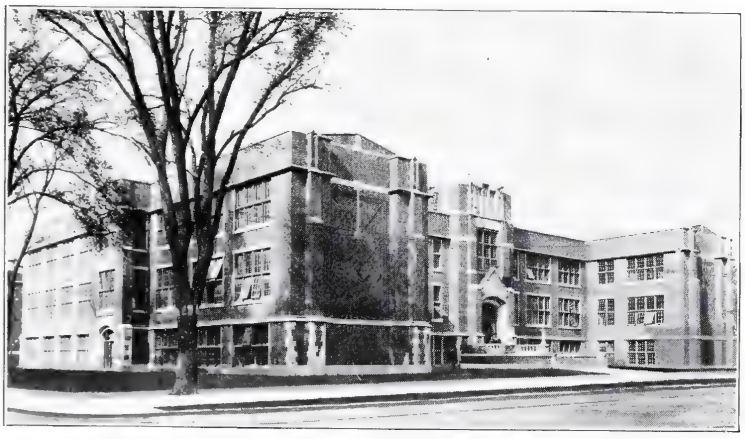

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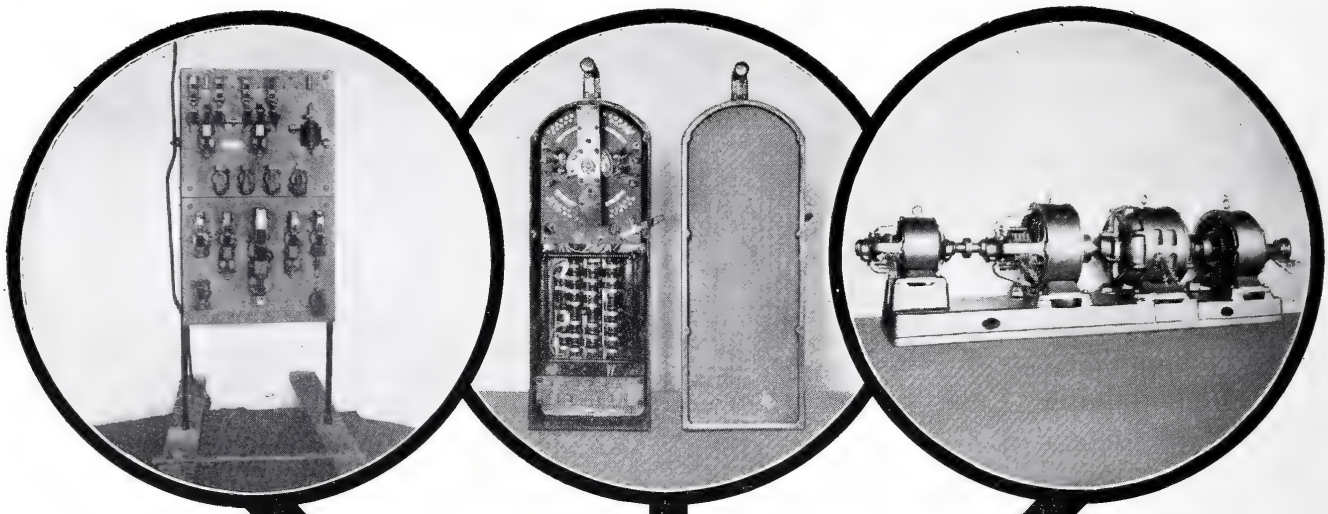

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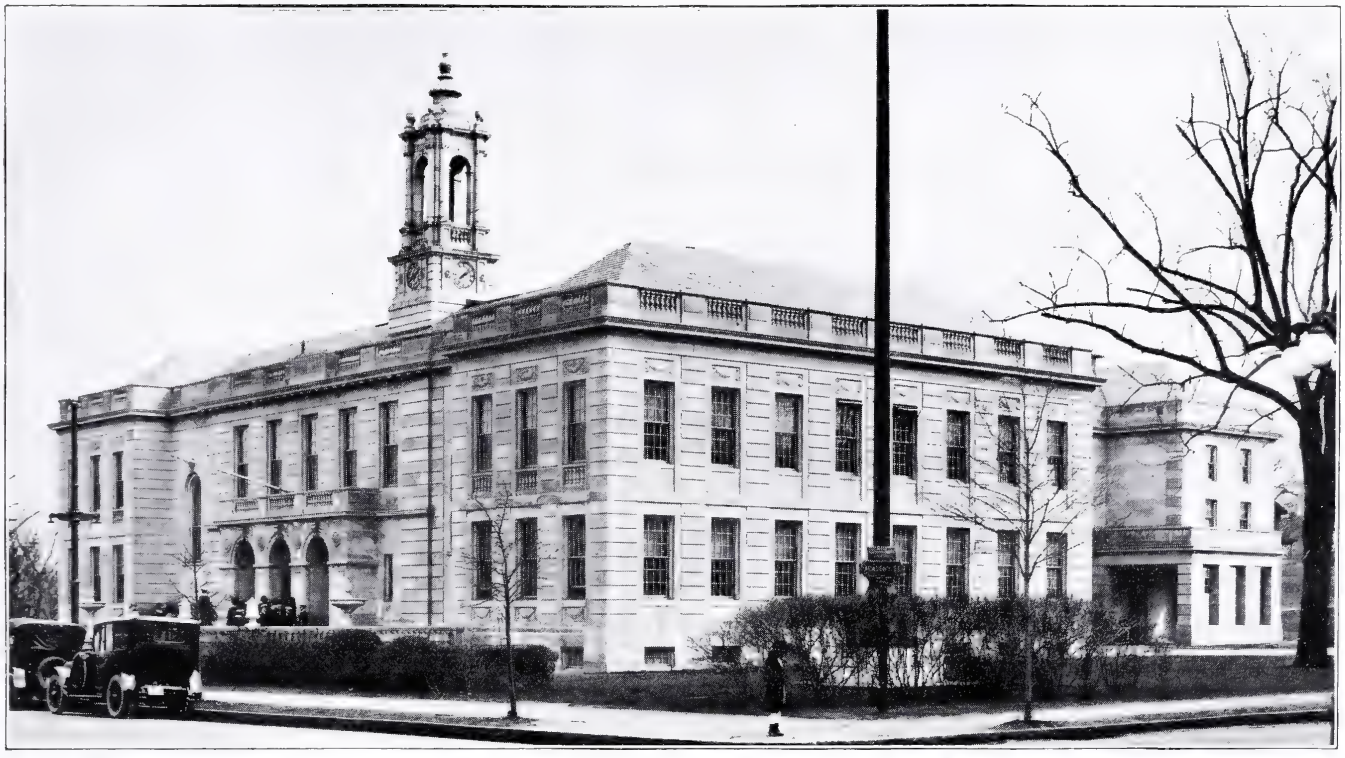

Arlington Town Hall, Arlington, Mass.
R. Clipston Sturgis, Architect

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THE ARCHITECTURAL FORUM

VOLUME XXXVII NUMBER 5

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ALBERT J. MacDONALD, Editor

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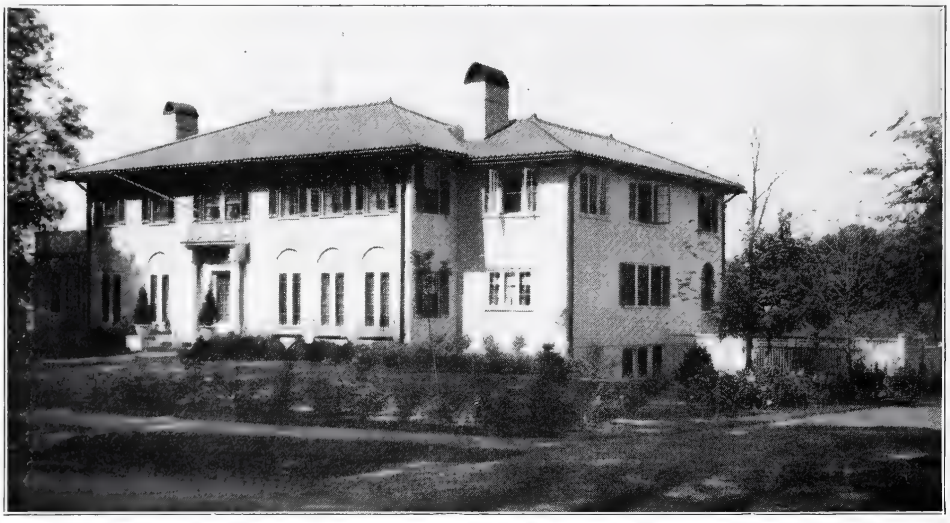

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THE EDITOR'S FORUM

PHILADELPHIA EXPOSITION

ON recommendation of the Engineers' Club of Philadelphia and the Philadelphia Chapter of the A. I. A., Paul Philippe Cret and E. B. Temple have been designated as architect and engineer, respectively, to take charge of the preliminary planning of the exhibition to be held in Philadelphia in 1926 in celebration of the 150th anniversary of the signing of the Declaration of Independence. In explaining the action of the Committee on Grounds and Buildings, headed by General Atterbury of the Pennsylvania Railroad, Colonel Franklin D'Olier, President of the Sesqui-Centennial Exhibition Association, said: "The purpose of this move is to work out a tentative plan of grounds and buildings on the Parkway-Fairmount Park site. Mr. Temple, in consultation with the Engineers' Committee, and Dr. Cret, in consultation with the Architects' Committee, and also with the approval of our association, will select their associate engineers and architects. They will form a small, compact, rapidly-working group of engineers and architects who will submit this plan at the earliest possible moment. Dr. Cret and Mr. Temple have volunteered their services as a matter of civic pride, and will act without compensation for this preliminary work."

HOSPITAL COMPETITION

AN interesting competition, open to architects and hospital superintendents, for the design of a small general hospital has recently been announced by *The Modern Hospital*, a monthly publication devoted to the interests of the hospital field.

Richard E. Schmidt, of the firm of Richard E. Schmidt, Garden & Martin, will act as professional adviser. The drawings will be judged by a jury consisting of two architects, two hospital superintendents and a graduate nurse, who has had experience as the superintendent of a small general hospital. Three cash prizes and two honorable mentions will be awarded, the prizes being first, $500; second, $300; third, $200. The drawings required comprise a perspective, two elevations and section, floor plans and plot plan arranged on three sheets.

Those intending to submit drawings are requested to register their names with *The Modern Hospital*, 22 East Ontario street, Chicago, and to apply for a detailed program. The final date for registration has been advanced to December 15, and the date for submitting designs to February 1, 1923.

ONE FORM OF PUBLIC SERVICE

THE value of carefully designed and well planned houses in establishing the character of a community is so universally acknowledged that it might seem to be unnecessary to dwell upon it. But the fact remains that only too often a prospective builder seeks to economize by leaving the planning of the house to a contractor who may have an "architectural department" of some kind, or else a plan is selected from a book of published designs which may or may not be of the character which would enhance the attractiveness of the locality in which the house is to be built. Everything is done, in fact, save the adoption of the obviously correct course and securing an architect to design the best house which architectural skill can provide.

It has often seemed that much might be accomplished were real estate boards or public organizations to interest themselves definitely in the improvement of building design. The raising of public standards and consequently of public values is in one way or another the *raison d'etre* of most public bodies, and what is more effectual in raising values than good architecture?

The Chamber of Commerce of Berkeley, California, has undertaken just this work by arranging for an advisory home building committee to which prospective home owners may come for suggestions. A small library of books and periodicals is to be formed for reference and supplying ideas, and names and addresses of local architects are given those who desire them. Considerable educational work must be done to improve the general standard of good taste and to bring the public to a proper valuation of good architecture, which of all the arts possesses the broadest appeal by coming most closely to the daily lives of the people.

THE MATTER OF SUB-CONTRACTS

THE Associated General Contractors of America have observed the tendency of some architects to divide their work into many small contracts and place them directly without the aid of a general contractor. Their Committee on Ethics has been requested to draw up a statement of conditions to discuss with the American Institute of Architects and other professional bodies. There is no desire on the part of architects to assume the duties of the contractor, excepting as they feel warranted by the failure of many general contractors to function according to expectations. A thorough discussion of the difficulty should help in arriving at the definite duties of each group.

LE BRUN TRAVELING SCHOLARSHIP

THE Le Brun Scholarship Committee of the New York Chapter, A. I. A., announces the holding of a competition for the award of this scholarship in 1923. Application and nomination blanks may be had of the secretary of any A. I. A. Chapter or of the Le Brun Scholarship Committee, New York Chapter, A. I. A., 215 West 57th street.

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The
ARCHITECTURAL
FORUM

VOLUME XXXVII NOVEMBER 1922 NUMBER 5

Architects' Vacation Sketches

INTERESTING EXHIBITION OF DRAWINGS BY ARCHITECTS AT BOSTON ARCHITECTURAL CLUB

DURING the latter part of September and the early days of October the great hall of the Boston Architectural Club was used as an exhibition room for a collection of sketches made by members of the club during the rambles and holidays of the past summer. The sole condition under which contributions to the exhibition were received was that the drawings were made during the vacations of this present year. The terms "sketches" or "drawings" were somewhat broadly interpreted, for some of the exhibits were drawings in pencil, crayon, charcoal, or pen and ink; a number were etchings or lithographs, while water colors were the medium in which a majority of the exhibits were made. The exhibition started with but two entries, but increased in scope day by day as new contributors brought in their work and installed it in place or as other contributors enlarged the number of their entries. Some of the exhibits had the added dignity of frames, while others were simply arranged on cardboard mounts. The informal manner of presenting the sketches rather added to their interest, when they were hung upon the long wall spaces of the great hall or else placed

Water Color of an Entrance Doorway
Grand Prize. By F. L. W. Richardson

upon benches when all the available spaces were covered, for the exhibitors were not professional painters but practical architects, who for the love of it had tried their hands at making pictures.

Of course there is a vast difference between the drawing which forms a large share of an architect's professional work and the drawing which is included in an exhibition such as this,—drawing which is practiced for the most part during the early days of one's career, or perhaps during foreign travels or while sojourning abroad. What generally follows as part of an architect's daily work is drawing of a much more technical and architectural character, more exact, necessarily drawn to a precise scale and so hedged about with restrictions of a practical or utilitarian nature that it is apt to lack the joyous freedom of movement, the spontaneity of feeling and the delicacy of touch which contribute so largely to the charm of sketches,—a charm which is necessarily absent in the usual drawing of an elevation. An architect's sketch is apt to be rather dry to a painter, who rebels at the restraint of rigidity of lines which necessity compels in most architectural drawing, and this rigidity is apt to become fixed when one's drawing is wholly of this character. What has been proved here, however, is that the faculty of easily handling drawing of a non-architectural character is by no means lost or always impaired by years of drawing of a more technical nature. Especial interest is found in the fact that these sketches are by architects and not by the younger draftsmen, who have lately been instructed in water color, and the exhibition serves two practical purposes in that it points the way to the younger men and proves to them that although the busy architect has but little opportunity for sketching, he still retains the ability necessary for it.

Water Color, Entrance, Old Mansion at Wiscasset, Maine
Second Prize. By Carroll Bill

In addition to being produced in different mediums the items included in this exhibition were drawings of a wide variety of subjects, in which architectural character by no means predominated. With an architect's well-trained eye for the picturesque which lends itself to the purpose of a sketch there were selected many subjects in which buildings occur, but many were the sketches in which buildings were wholly lacking. Many

Water Color, Old Houses at Nantucket, Mass.
By Hubert G. Ripley
Mention

VACATION SKETCHES
BY BOSTON ARCHITECTS

At Right, Water Color, End of Old House at Nantucket, Mass.
By Hubert G. Ripley

Below, Etching, Old Custom House, Boston
By A. H. Hepburn

of the subjects, as might be expected, were chosen from among the quaint byways and forgotten corners which are still many in Boston, notwithstanding all the tearing down and building up which accompanies the march of progress. A. H. Hepburn contributed two delightful etchings, one of the west end of the state house as seen through Mt. Vernon place, and another of the heavy Doric portico of the old custom house. Views of bits not far away formed the subject of Carroll Bill's "An Old Mansion in Wiscasset, Maine," where the most sketchy

Pencil Drawing by Oliver P. Morton

Water Color of an Interior
Second Prize. By Nelson Chase

of drawing was used, the shadows of trees playing across the front of an old white frame house possessing a most charming quality. Several delicate little water colors of bits along the Nantucket coast came from Hubert G. Ripley, one being a village street with a group of two small, prim New England houses with huge stack chimneys, and the other one end of a rambling old frame house overgrown with greenery which climbs the walls and twists itself about a tall brick chimney. Another bit sketched along the Massachusetts coast was the pencil drawing of an old colonial doorway embowered in green, by Oliver P. Morton, and other water colors were a "Boy on a Veranda" by James Clapp, and "Boys by a Brook" by Robert P. Bellows, and an interesting interior of an old dining room by Nelson Chase.

But not all of the exhibits were glimpses of details comparatively near at hand, for one very delightful water color was that by Timothy Walsh showing a view in Venice with the companile and several of the Byzantine domes of St. Mark's, while the water color which received the supreme prize, by F. L. W. Richardson, shows "An Entrance Door" which might have been sketched in Italy or Spain. Evidence of travel in other lands not as far distant as Venice or Spain is presented in a number of sketches by Ralph W. Gray of bits sketched in Bermuda; one is a fine little water view with rising clouds, a sketch which is broad and sure and as simple in its technique as it is admirable in its conception, while another is a study of the gnarled branches of old tamarisk trees, a sketch full of decorative quality. In several instances where a number of items were sent by the same contributor it was interesting to observe that they varied so greatly in color and method as almost to suggest the sketches having

VACATION SKETCHES

BY BOSTON ARCHITECTS

Water Color, Boy on Veranda
By James Ford Clapp
Mention

Water Color, Campanile,
San Marco, Venice
By Timothy Walsh

Water Color, Seaside Pool
By Robert P. Bellows

been made by different artists—direct contrasts of technique or the use of mannerisms so widely different that they show the use of several wholly different styles.

Of course as might have been expected with an exhibition so interesting prizes and even mentions were too few to be awarded to all the items well deserving of honors. The rough and tumble-down buildings which fringe the waterfront of Rockport and overhang the water's edge were painted in water colors by Frank A. Bourne; C. L. Pitkin sent a crayon drawing of the Quincy market in Boston, and from Walter H. Kilham came a number of tiny water colors of interesting bits in Boston's west end, where steep grades and unusual layouts of old streets sometimes bring about unexpected dispositions of buildings. From the brush of R. Clipston Sturgis came eight small sketches done in a remarkably brilliant style, showing old roads in and about Portsmouth; J. Lovell Little contributed two sketches of the woods in northern Maine, virile and emphatic in tone and technique, one particularly which showed through a group of gaunt tree trunks in the foreground a view of a distant lake and mountain. The first prize was awarded to F. L. W. Richardson for his water color "An Entrance Door"; second prizes were voted for exhibits in various mediums to Carroll Bill, Nelson Chase, O. R. Freeman, Ralph W. Gray, M. B. Gulick and A. H. Hepburn, while mention was given to W. T. Aldrich, James Ford Clapp and Hubert G. Ripley.

The enthusiasm which this exhibition of vacation sketches aroused among Boston architects, and the interest which it created upon the part of the press and the public in general, might well stimulate the holding of exhibitions of somewhat similar scope in other cities. There is hardly a town or city in America which does not offer interesting material for sketching, and local architects might welcome the pretext which such an exhibition would afford to renew contact with a field of work which may be in danger of being crowded out or forgotten in the daily work of the office.

In England it has for many years been the custom to encourage draftsmen to make sketches and measured drawings of the fine examples of old architecture in which England and the continental countries abound, for it has been found that the draftsmen are benefited by their own attempts and by comparison of their own work with that of others; it has also been found that such sketching tours are of benefit in another way, for intimate contact with fine work brings its own reward in heightened appreciation of detail, mass grouping, composition and other aspects of architectural work which finds expression in actual practice.

Etching,
Massachusetts
State House
from Mt. Vernon
Place, Boston

By A. H. Hepburn
First Prize in
Black and White
Medium

Mexican Renaissance

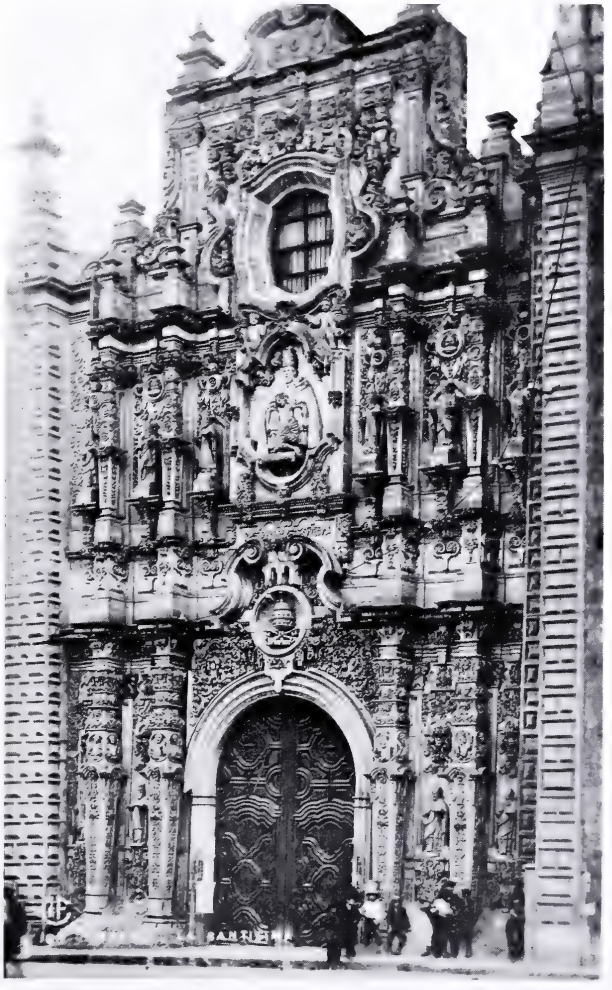
PART I

By WALTER H. KILHAM

A MODERN geography, in high favor at the present time in public and private schools, disposes of the architecture of Mexico with the statement that "the houses of the people have but one story and are commonly built of sun-dried bricks or adobe held together by layers of mud, the ceilings being made of brush and the floors nothing but earth or stone," qualifying the remark slightly by adding that "this description does not apply to wealthier and educated Mexicans, but even these have adobe houses which somewhat resemble those of southern Spain." When statements of this sort go unchallenged and are officially taught to the rising generation, it is not remarkable that the true story of architecture in that country remains generally unknown to our people.

As a matter of fact, it would be more correct to say that up to about 1820, the date of Mexican independence, Mexico was the only country on the American continent which practiced architecture at all in the real sense of the word, for prior to that time the buildings of the English colonies and the United States were comparatively small in size and slight in construction, with thin walls and wooden roofs, devoid of sculpture or mural decoration, and of a degree of artistic development which entitles them to consideration more for sentimental reasons than for any great merit, while those of the other Spanish settlements are generally of less artistic importance than those of Mexico, though ordinarily of solid and scientific masonry construction. This frugality of architectural output in the English colonies was of course due partly to the over-abundant supply of timber and partly to the scarcity of labor, for the native Indians were few in number and intractable at that; but it was also brought about by the fact that the English and Dutch settlers were not natural builders, as compared with the Latin races. In Mexico, however, these conditions were reversed. Good building stone was plenty, timber was scarce, and the populous native races, once conquered, proved surprisingly amenable to direction, when they were baptized and taken into the fold of the church. With an abundance of labor available the task of building notable and enduring structures was much simplified, but failure might even then have ensued if the directing race had not been endowed with unusual talent for the designing and construction of important buildings.

Of course a highly developed technique was not attainable at the beginning, and the early buildings, rude rather than elegant, sought to satisfy the most urgent needs rather than good taste and perfect convenience; a contemporary writer says of them that "so solidly were they built, one would say they were not houses but fortresses." Nevertheless, such buildings as the palace of Cortez at Cuernavaca or the Casa Alvarado at Coyoacan, both built within a very few years of the conquest (1521), even though the walls are of rather undue thickness and the arches low and squat, are of a far greater degree of sophistication from a constructional standpoint than anything produced in the American colonies before the revolution.



Portal of La Santísima Trinidad, Mexico City

While the bibliography of travel and politics in Mexico is considerable, and much study has been directed toward her prehistoric remains, very little serious work has been done towards presenting a complete story of the Spanish architecture of the viceregal period. Probably

Facade, Casa del Alfeñique, Puebla, Mexico

the best book on this subject, although it is all too brief, is the very interesting essay entitled "El Arte en México en la Epoca Antigua y durante el Gobierno Virreinal" by Lic. D. Manuel G. Revilla, published by the Mexican government in 1893. Other handbooks are those on "Arte Colonial" by D. Manuel Romero de Terreros, and the attractive "Monografias Mexicanas de Arte" by Jorge Enciso, Inspector General de Monumentos Artisticos. This author's title is worth noting, together with a passing speculation as to how long it will be before the United States will feel able to support an official of this description. It is interesting to remember also that none of the recent revolutionary governments has interfered with Señor Enciso's work. "The Spanish Colonial Architecture of Mexico," by Sylvester Baxter, is splendidly illustrated by photographs, but the real secrets of the design of this period can only be revealed by drawings, which so far are extremely scarce.

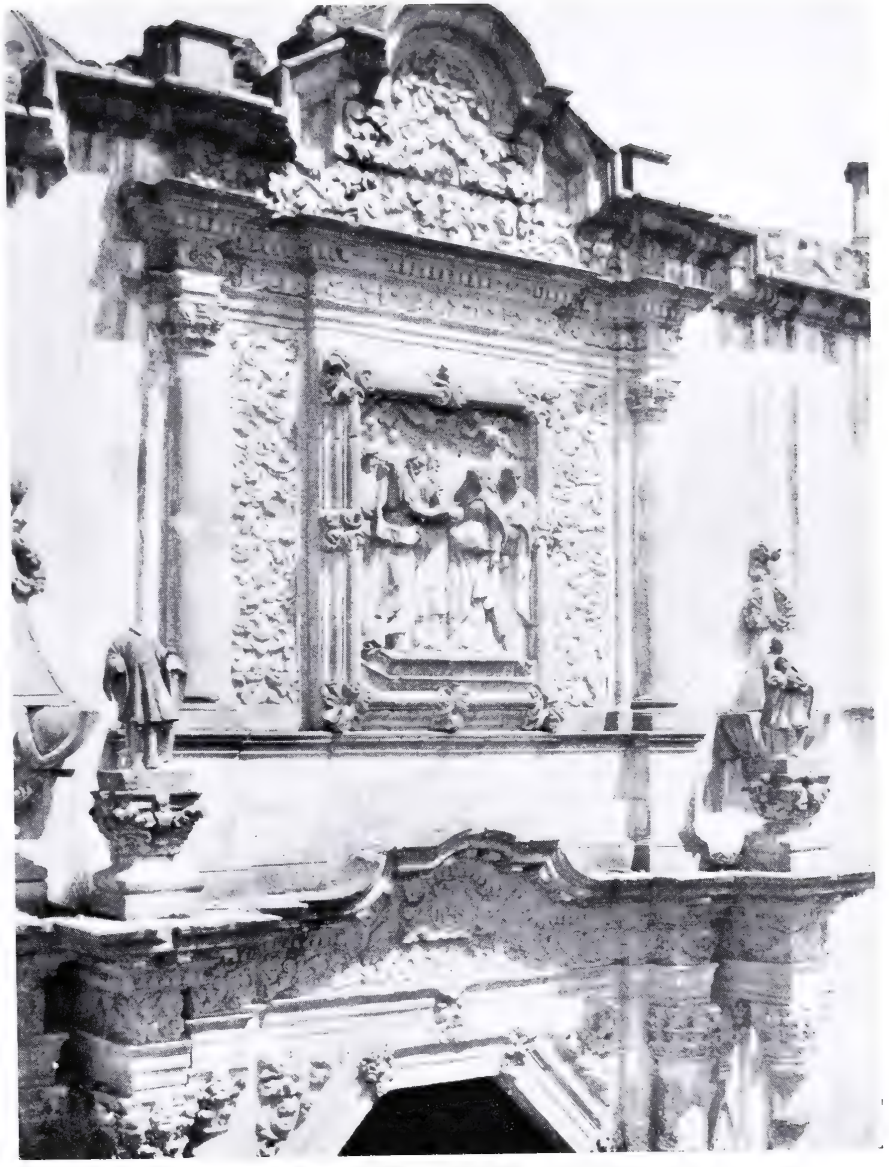
The new colony found it difficult at first to work up to the speed of the prevalent plateresque work in old Spain, which even there must have looked to the conservative hidalgos of the time about as startling as a cubist picture still does to the worthy critics of our own day. The earliest churches of Mexico, such as San Francisco and the Capilla Real at Cholula, either displayed vaults with ribs, reminiscences of late Gothic style in the one, or in the other a sort of replica of the Mosque of Cordoba, with 49 actual domes (*bovedas*) since raised on the original pillars, recalling the still recent Arabic influence in Spain, while the noble interior of San Juan Bautista at Coyoacan is a veritable basilica with its timber framed roof, massive square pillars and deeply worn flagstone floor.

The true renaissance cruciform plan, with a dome or cupola over the intersection of nave and transept, very likely a reminiscence of the *cimborios* of old Spain, however, soon appeared and before the end of the sixteenth century prevailed universally in church design, while on every hand the growing wealth and power of the colony expressed itself in magnificent palaces and handsome public buildings as well as churches. "As builders, after the Romans come the Spaniards" is a saying in Mexico, which seems fairly truthful when one contemplates the extent of building operations carried on during the three centuries of Spanish supremacy. With the advent of the seventeenth century the colonial style swung into the full current of the prevailing *barroco*, with its capricious proportions, heavy and pompous members and broken pediments, a real style nevertheless, and in the hands of the Spaniards one of extraordinary character.

The eighteenth century was the apogee of New Spain. At that period its religious communities, nobility and principal citizens had acquired considerable fortunes. Numerous building projects were undertaken, and older buildings were remodeled in accord with the prevailing taste. The general decadence in Spain under the third Philip was reflected in her provinces, and the arts were not exempt. The *barroco* merged into the Churrigueresque, and the

Detail of Doorway, Casa del Alfeñique

DETAIL OF DOORWAY



CARVED BAS-RELIEF OVER DOORWAY

PORTAL OF CHURCH NEAR S. JUAN TEOTIHUACAN, MEXICO

FROM PHOTOGRAPHS BY WALTER H. KILHAM

two styles mingled so as to be almost indistinguishable. In both the relation of exterior decoration to the actual construction was often disregarded; the *barroco* retained the column as a decoration, though frequently with a twisted or figured shaft, while the Churrigueresque changed it to a pilaster, thicker above than below, and seeming to hang from its cornice rather than to support it. The members are decorated with complicated panels, friezes and garlands, and the pediments writhe in intricate convolutions which baffle the pencil of the sketcher; one is amazed at the imaginative power of the designers. Good examples of this riotous form of design are the two churches of the Sagrario and the Santísima Trinidad in Mexico City. The elaboration and intricacy of these designs are almost inconceivable to an American mind, but at the same time the harmony and proportions of the composition are never lost. In the facade of the Sagrario particularly, the framing of the gray mass of the portals between the plain flanking masses of pink *tezontle* throws the lively sculpture into the high relief characteristic of all Spanish work, whether at home or in the colonies, and emphasizes the brilliant light and shade on the carved stone. But not alone did the Spaniards direct the toiling natives who carved the fronts of these buildings. Motifs and details appear which never came from old Castile, and just as the conquered Arab impressed his taste on the cities of Spain, so did the poor Aztec workman in some mysterious way weave the pathos and genius of his lost race into the facades and towers which the conqueror claimed as his own.

Tower of La Concepcion
Mexico City

One is almost at a loss to choose examples of the baroque influence among the amazing examples of brilliant Mexican work; their number is legion, and I will confine my illustrations to two or three which have never before been published. One is the portal of a little *hacienda* church near Teotihuacan, far from any town or high road, which I happened on by mere chance. The twisted columns on either side of the door carry a coquettishly elaborated entablature topped by carved urns, and the whole supports an upper story consisting of a beautifully carved bas-relief framed by Corinthian columns and decorative side panels. It was interesting to note that the interior of this church, built on the plan of a perfect Greek cross, is entirely carried out in gray stone in a style of Doric chastity perfect enough to excite comment anywhere. San Domingo in Mexico City is another baroque facade of good proportion and elegant detail. The large figure panel above the portal is of particularly good execution.

Photo © C. B. Waite, Mexico

Detail of House in Calle Manrique, Mexico City

Another form of the baroque is that which gives to the city of Puebla its distinctive and charming form of domestic architecture of which the well-known Casa del Alfeñique is the best example. Puebla, on the high road from Vera Cruz to the capital, was a great trading center between Mexico and Spain, and very probably due to its constant communication with Seville, the seat of the council of the Indies, its architecture shows a considerable influence of the Arabic or Mudejar style which manifested itself in the use of tiles for the facing of the exterior facades of the houses and in the widely projecting stone

cornices and *antipechos* or balconies, very thin and carved with the most elaborate profusion. Alfeñique is Spanish for "almond cake," and the name means "gingerbread house"; it is nevertheless one of the most beautiful domestic structures in the world. The patio, though small is of the greatest charm with its delicate ironwork, airy open stairway and graceful arches. A house nearby on the same street has a curious cornice in the shape of a succession of wagon tops sheltering a long balcony. The walls of these houses and many others in Puebla are of red unglazed tiles with insets of colored glazed tile in patterns, but the effect, while interesting, is not as striking or as beautiful as that of the famous Casa de los Azulejos in Mexico City, an excellent example.

The quality of the Spanish architecture, however, depends not at all upon its detail. The visitor, lost in a rather puzzled study of the elaborate church and palace facades, often fails at first to note how the enriched surface is always flanked by powerful buttresses of plain stone. The towers, whose bell chambers are always elaborately carved and decorated, never fail to rise from massive and simple bases, and their profiles are always noble, even if sometimes their nobility is tinged with a certain arrogance. The peculiar local method of hanging the bells which swing in the arches lends a characteristic flavor to the weatherbeaten old belfries, though due to the insistent cries for "reform" (how many crimes have been committed in that name!)

Photo © by C. B. Waite, Mexico

Detail of Stone Carving about Doorway, Church of the Sagrario, Mexico City

the bells of many an ancient church have gone to the melting pot or have even been sold to the Gringos. The photographs show the massive tower of La Concepcion in Mexico City and the Giralda-like shaft of the cathedral at Cuernavaca, but many other pictures would be necessary before the subject could be adequately presented.

The renaissance gave Mexico the dome which, always a striking feature, attains here an extraordinary development, always built of solid masonry, displaying its actual construction, without false inner or outer shell, and as it is employed in great numbers its use imparts a singular sweetness and majesty to the skylines of the cities. So numerous are these domes that one might almost say that the poorest pueblo in Mexico possesses a collection that, built as they are of solid masonry, would create an architectural sensation in New York even, and they were constructed with such facility that many churches possess five or six and, as just said, the Capilla Real at Cholula has actually 49. Some domes rise simply from the crossings above the curved vaults of the roofs, which in Mexico are exposed to the weather, no protective wooden roof being required. Others are raised on drums which may contain windows, which again may be treated with pediments or curved tops breaking into the base of the cupola. The dome itself may be flattened, as in the case of the cathedral at Puebla, or elongated vertically as in the Capilla del Pocito at Guadalupe (see THE ARCHITECTURAL FORUM for March, 1921), or it may be a regular half-orange as is usually the case. It generally carries a lantern (*linternilla*) and in many cases is covered with enameled tiles of blue, red and yellow, laid either in geometrical patterns or forming magnificent and grandiose coats of arms.

By the time the visitor has assimilated the relations of mass and outline to the applied ornament, he begins to discover that what he has been calling renaissance is in many cases not renaissance at all in the European sense of the word. Where in France, Italy or Spain are found such powerful contrasts of the shadows of deep-set window jambs with delicate mouldings? And the profiles of the mouldings themselves—what decision of line, what vigor in the smallest member! Surfaces ordinarily vertical are inclined outwards to catch the high lights,—overhangs are exaggerated to produce sharply ruled horizontal shadows until the whole facade seems to play and sport with the sunbeams like a tossing fountain. Everyone knows that in sparkle and brilliance the early renaissance of other countries is a dull thing compared with that of Spain; the possibilities of the later renaissance should be studied in Mexico. Note for example the carving of the detail of the building in the calle Manrique in Mexico City, once the palace of the Condé de Heras. The crispness and brilliance of the carving is beyond criticism. The play of the scrolls of the arabesques, the serpent-like ornament between the posts of the balustrade, and the masks at the top of the corner ornament are certainly as pre-Spanish as any ornament can be, while the relief of the ornament is heavier than that of the usual renaissance. The spirit of the detail is Aztec, the effect renaissance.

Photo © by C. B. Waite, Mexico

Cathedral at Cuernavaca, Mexico

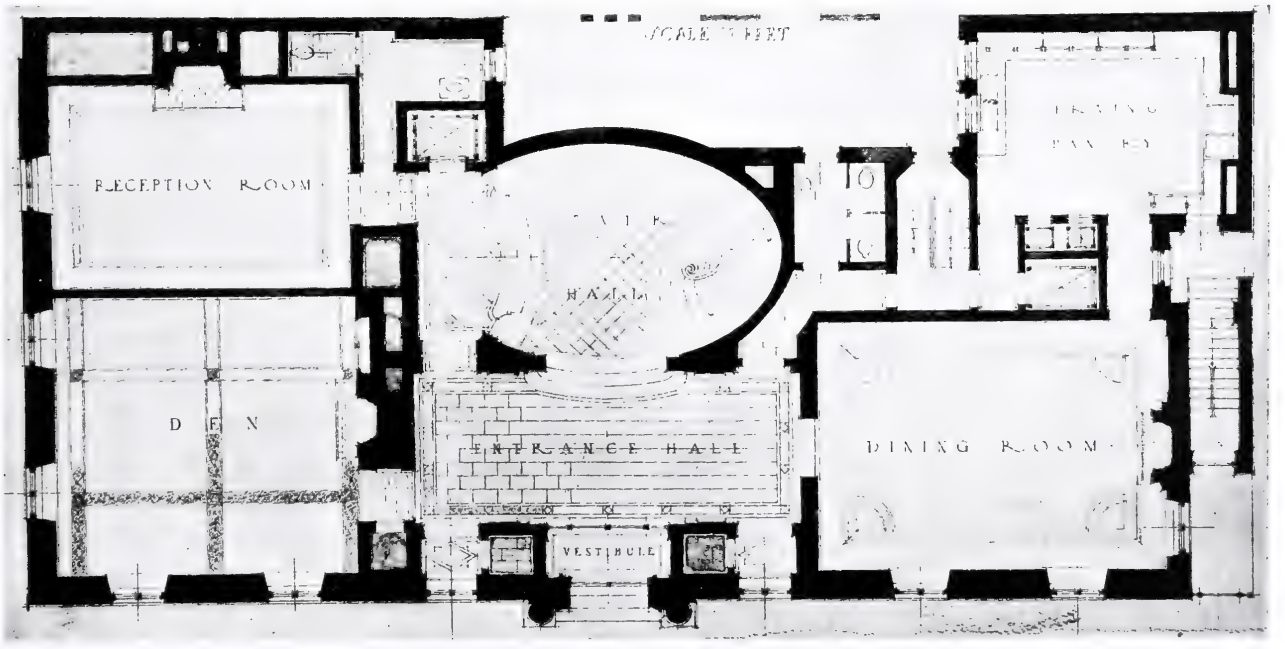
Photographs by Mattie Edwards Hewitt

DETAIL OF ENTRANCE

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

GENERAL EXTERIOR VIEW



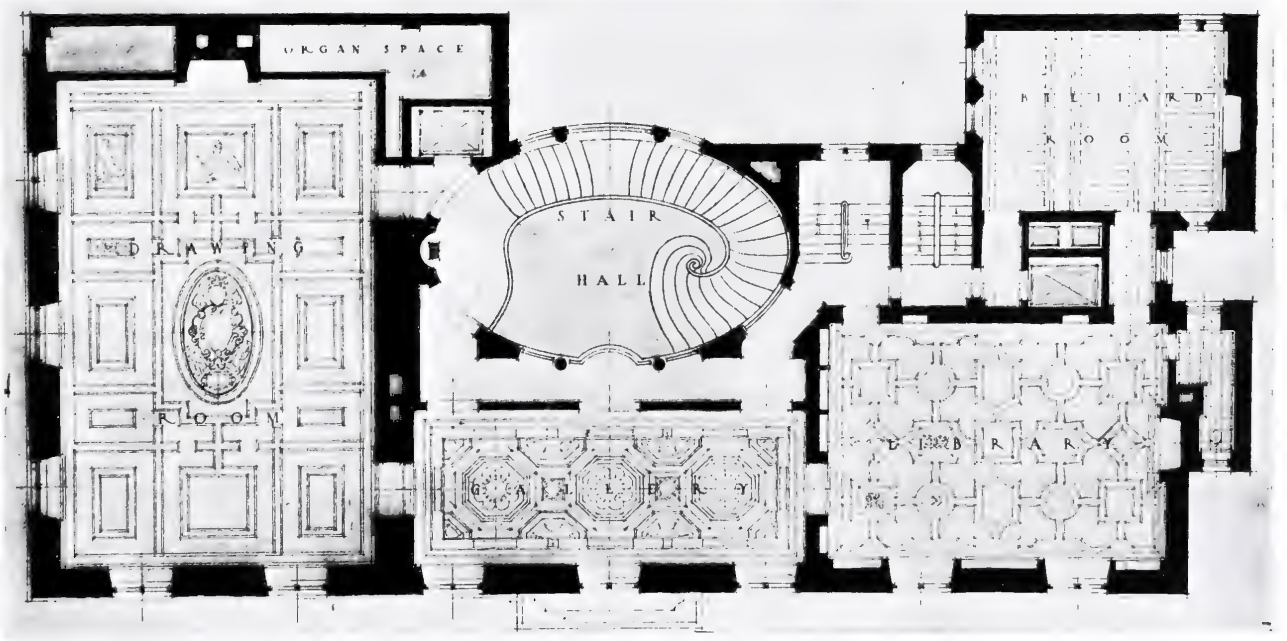
FIRST FLOOR PLAN

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

LOUIS XVI RECEPTION ROOM

Arthur S. Vernay, Decorator



SECOND FLOOR PLAN

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

STAIR HALL

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

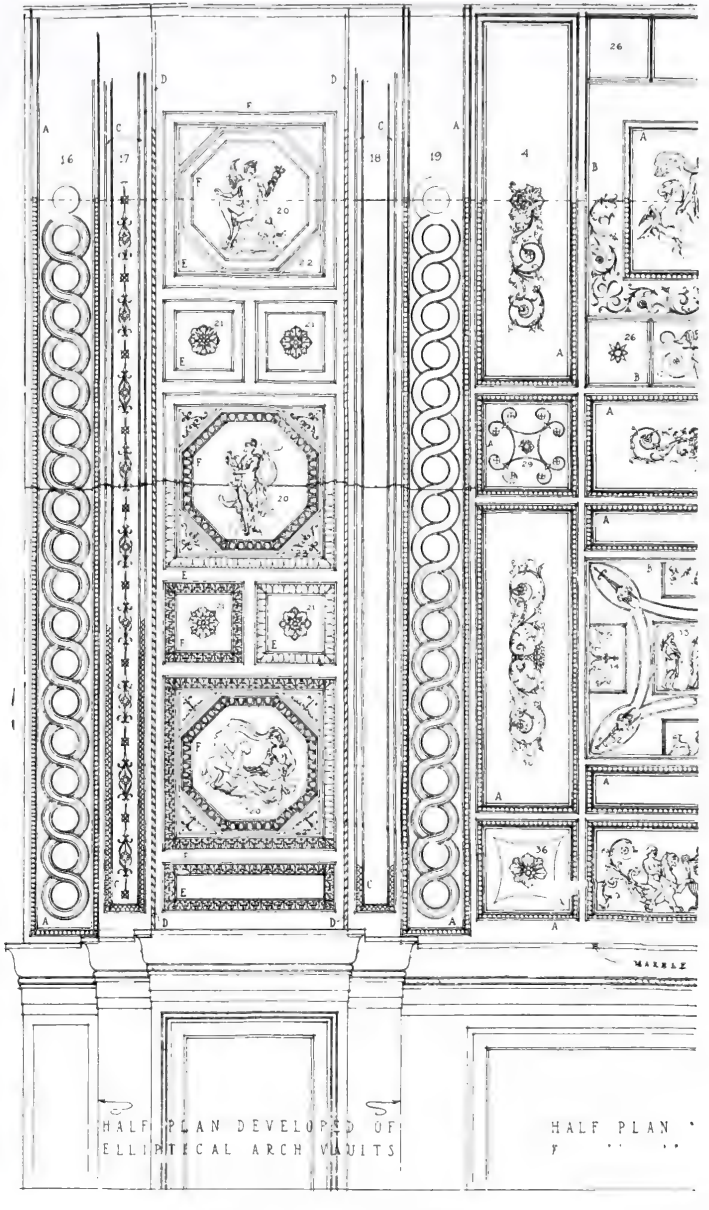
STAIR HALL

ELEVATOR DOORWAY

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

ENTRANCE HALL



DETAIL OF PLASTER CEILING

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

DETAIL OF ENGLISH PAINTED PINE CHIMNEYPIECE IN DINING ROOM

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

SECOND FLOOR GALLERY

PLAYROOM ON ROOF

Mural Decorations by Robert Winthrop Chanler

HOUSE OF MRS. WILLIAM HAYWARD, NEW YORK

GUY LOWELL, ARCHITECT

ITALIAN RENAISSANCE DETAILS

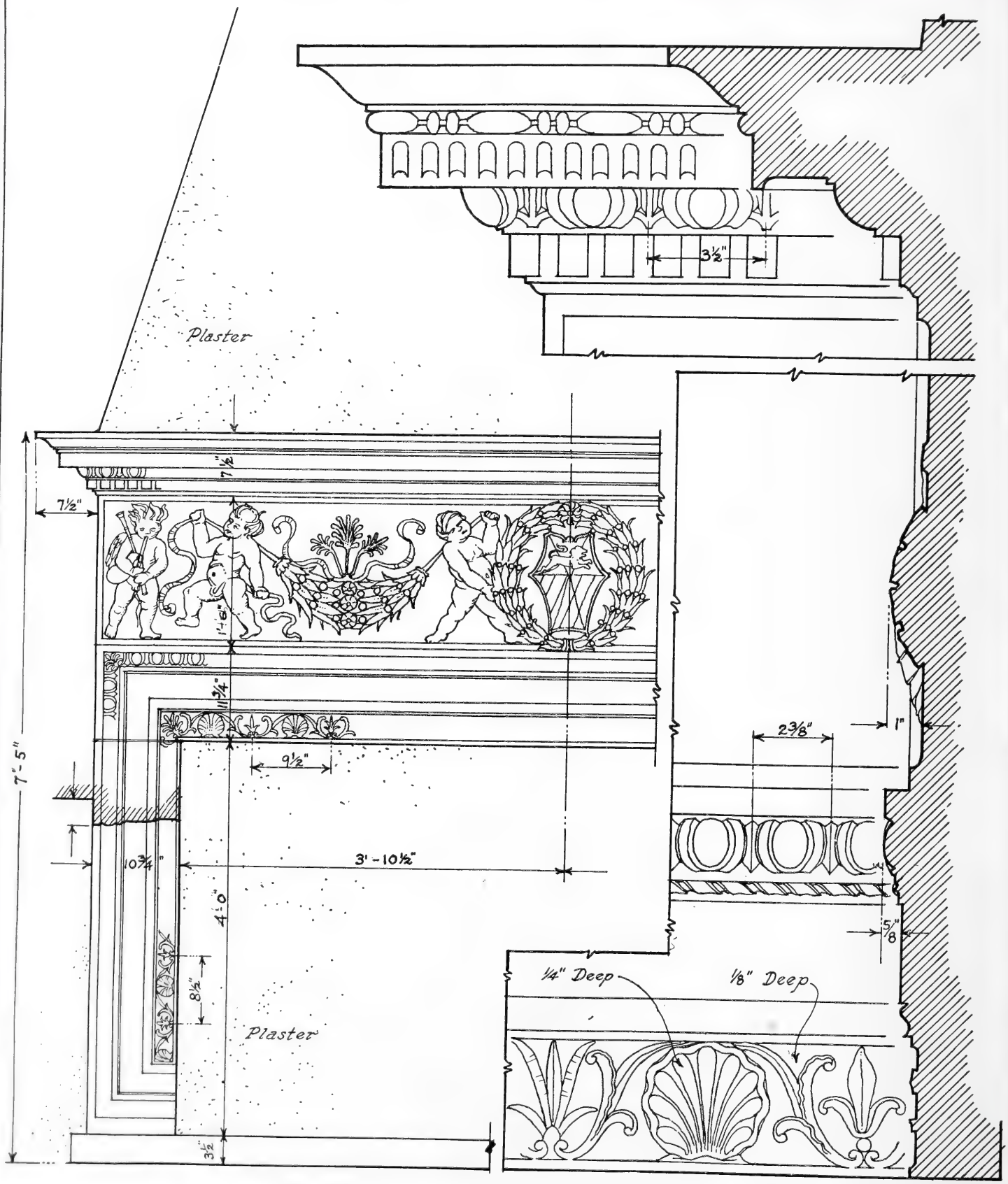
A SERIES OF MEASURED DRAWINGS

By HOWARD MOÏSE

CHIMNEYPIECE IN LARGE HALL OF MAIN APARTMENT

PALAZZO DAVANZATI, FLORENCE

PALAZZO DAVANZATI is one of the few structures still remaining from the period when Florence was at the height of her power. Built originally for the Davizzis, it remained in the hands of the Davanzati family from 1578 to 1838, falling then into decay from which it was rescued by Prof. Volpe, restored and furnished with much of its oldtime magnificence. The large hall of the main apartment still retains its old painted and cross-beamed ceiling, and the stone chimneypiece illustrated here is adorned with figures of dancing children, carved in spirited fashion, while the hooded form which the wall over the chimneypiece assumes tends to minimize the expanse of space between the cornice of the chimneypiece and the ceiling.



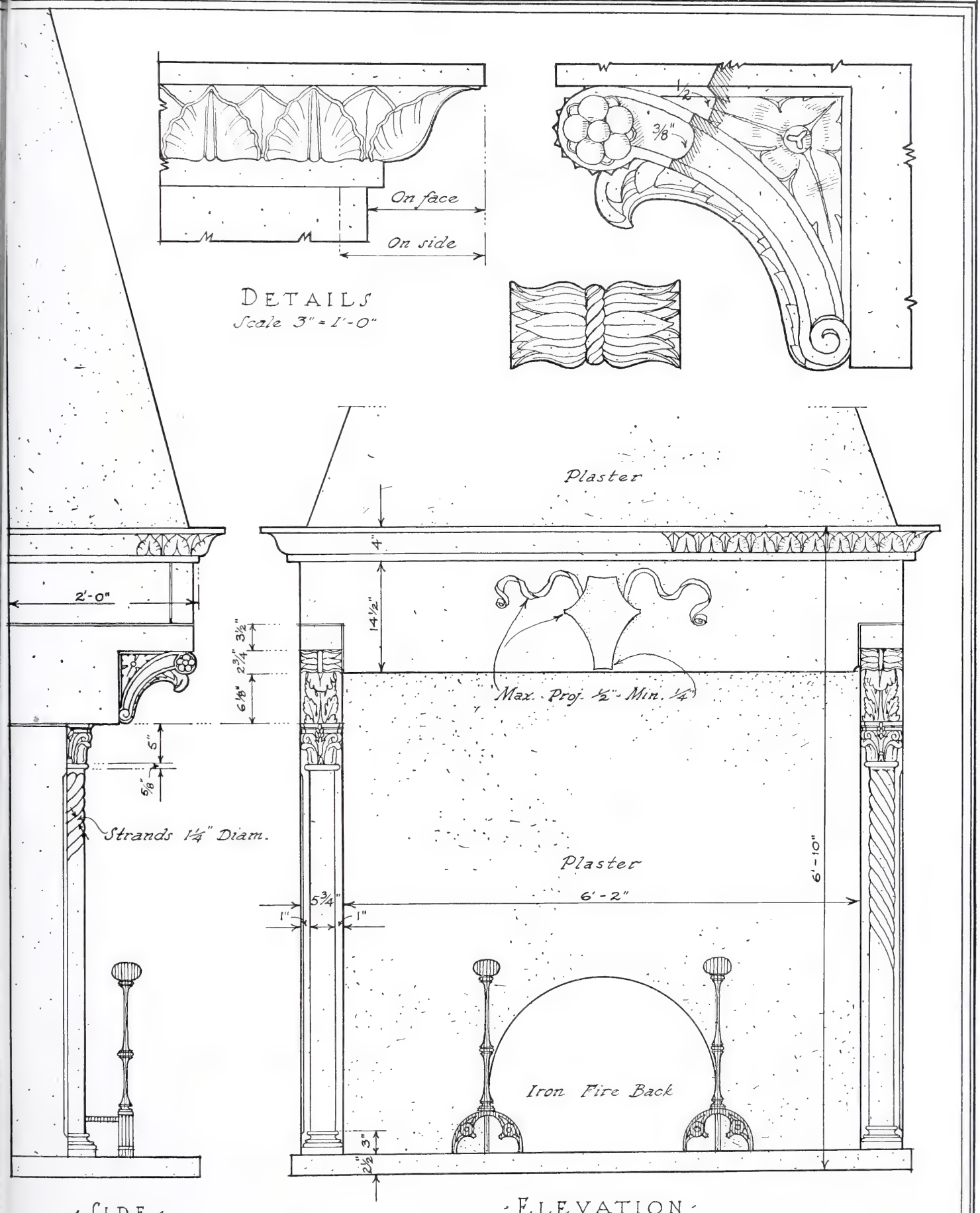
ELEVATION
Scale 3/4"=1'-0"

DETAIL
Scale 3"=1'-0"

ITALIAN DETAILS 1922

·FIREPLACE·
PALAZZO·DAVANZATI·FLORENCE

MEASVRED *and* DRAWN *by* HOWARD MOÏSE



DETAILS
Scale 3" = 1'-0"

·SIDE·

·ELEVATION·
Scale 3/4" = 1'-0"

ITALIAN DETAILS 1922.

·FIREPLACE·
PALAZZO·DAVANZATI·FLORENCE

MEASURED and DRAWN by HOWARD MOÏSE

ITALIAN RENAISSANCE DETAILS

A CHIMNEYPIECE IN A MINOR APARTMENT

PALAZZO DAVANZATI, FLORENCE

DESIGNED like all the great palaces of old Italian cities to shelter various members of a large family in patriarchal fashion, this building includes many great halls and rooms of other kinds, from one of which the chimneypiece illustrated here has been drawn.

It is a particularly good example of the Italian hooded mantel supported by corbels, and lends itself readily to modern adaptation because of its good scale and general simplicity. The carving is in low relief, hardly any portion having a depth of more than one-half inch. The Davanzati Palace was designed by Michelozzi, the successor of Brunelleschi.

BUSINESS & FINANCE

C. Stanley Taylor, *Editor*

Recent Progress in Developing Co-operative Apartment Buildings

ABOUT two years ago there was presented in a series of articles in THE ARCHITECTURAL FORUM a general review of progress to that date in the development of co-operative apartment house projects. In view of the large volume of building construction which has occurred in the apartment house field since that time it is but natural that there should have been a crystallization of ideas and a broadening of experience in this field which is of considerable interest to those who contemplate carrying out such projects in the near future. In this article, therefore, we shall consider certain business features which have become more definitely established as important factors in the success of a co-operative building venture.

One important conclusion which may be drawn from the added experience of the past two years in this field is that in the development of a co-operative building project success is more certain under what is termed "the 100 per cent" plan of ownership. When this subject was last reviewed in THE FORUM past experience had left open a choice between two plans: first, the 100 per cent plan, in which the entire building is occupied by tenant-owners, and, second, the rental and ownership plan under which a proportion of the building space is reserved for renting at prevailing market rates.

While it is quite logical to assume that the rental income from such space will serve to reduce the overhead cost of occupancy on the part of tenant owners, experience has shown that the added detail of operation and management, the increased investment required, and the danger of being forced to carry unrented space during periods of depression would seem to overbalance any benefit which might directly accrue through rental profit on the space not occupied by tenant-owners. In other words, it has become almost axiomatic in the field of co-operative apartment promotion and ownership that the only successful plan is the 100 per cent ownership plan.

A number of interesting facts and opinions relative to this and other points of importance in a consideration of the co-operative plan have been drawn from comments made by Frederic Culver, President of the Joint Ownership Construction Company. This is the company which developed the building at 136 East 67th street, New York, illustrated in this number of THE FORUM. The exact business methods of this building indicate some important points:

"A corporation known as 136 East Sixty-seventh street, Inc., was formed in which title to the property was vested. The stockholders are the occupants of the building. Thus a tenant-owner has an interest in the entire property and is entitled to a 99-year lease on the apartment which he selects. The lease, with his stock, gives him virtual ownership of his apartment. Every apartment in the building is sold. No space to rent is reserved, and therefore speculating in renting apartments and carrying vacancies are eliminated, as every individual owner pays a pro-rata share of the operating expenses of the building. It is a fixed annual sum and precludes the right to make any assessment.

"Reducing apartment rents to just what it would cost a landlord to operate the building is precisely what is achieved, and all landlord's profits are eliminated. In other words, all that an owner pays is exactly what it costs to run the building. It is a logical fact that 25 people can operate one building more cheaply than they can operate 25 separate dwellings. Joint ownership affords a home to a purchaser at less than it can be maintained for in any other way.

"The building has been restricted as to the character and financial responsibility of the tenant-owners. The directors of the corporation, elected annually from among the stockholders for a year, pass on all subleases and resales. In that way the building's original standing is maintained, and although it may restrict the market as regards resale to a certain extent, it considerably enhances the value, as people are willing to pay premiums to purchase in a house having the highest class of occupants. In other words, the directors act in the same capacity as does the committee of admissions to a club. The actual management of the building is taken care of by Culver & Co., affiliated with the Joint Ownership Construction Company, Inc. In that way the operation of the building is in the hands of an experienced concern, relieving the owners of care in that respect.

"There are two aspects to the situation which would have a great influence in determining the future of co-operative enterprises for urban community buildings. One would be whether or not the majority of future developments would be along conservative or quasi-speculative lines. If the investment public should pursue the speculative line, that course would be attended with more or less danger and might retard or kill the movement. For that reason the plan of making a success of the enterprise depends on renting at the prices specified in the promotion plan. If apartments to rent on speculation were included and the prices presumed to be obtained for this space not be obtained the owners would have to make up the deficit, which would react on the investing public. To avoid that danger this company determined to sell stock covering every apartment in the building erected by it and thus by determining the maximum fixed sum its clients would be called on yearly to pay prevent their suffering any disappointment.

"It is more difficult to sell under that plan because it seems to call for a larger fixed annual rent charge than do more speculative plans. These specious proposals, involving rent speculation, lead investors to think that they will get the results that the promoter specifies (the promoter always puts his best foot forward), and are bound to please the unthinking investor more than a more conservative plan.

"It is obvious that if a building were financed on the plan of 90 per cent of the value in mortgage and 10 per cent in stock, whether it were 100 or 50 per cent joint ownership, the price to be paid for the stock would be comparatively small, and if the mortgage were 40 per cent and the equity 60 per cent of the value the cost of the stock would increase, and so would the safety factor. A mortgage of 40 per cent on a first class building

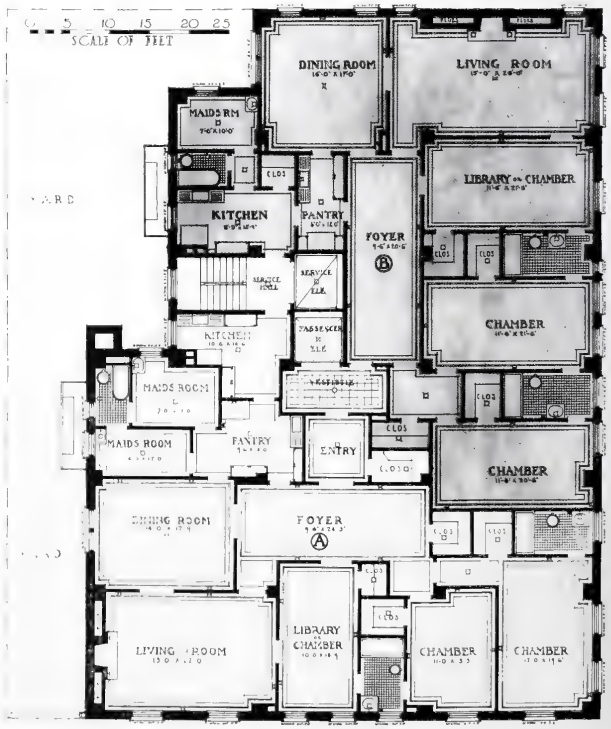
Co-operative Apartment House, 485 Park Avenue, New York
Dwight P. Robinson & Co., Engineers and Constructors

in a first class location in New York should, under normal conditions, be easily and at all times replaceable. For the ultimate success of co-operative apartment enterprises on a very large scale two factors are essential: first, the ability of the owner of that class of stock to borrow on it from a bank or trust company, and, second, the marketableness of the stock in question.

"It seems to be a perfectly logical evolution, if we grant that in cities the apartment house is bound to displace the private residence, that the form that the organization will take will approximate in every essential something akin to private houses, so far as to transfer to title is concerned. The general form that the co-operative apartment investment has taken makes the securities given in representation of ownership, from every point of view, much more marketable than the private residence. For instance, a title insurance policy covers the title; the transfer of title means merely the endorsement of a stock certificate and the examination of the roll of occupants of the building and of its books, which are kept, under good practice by some responsible trust company, to ascertain if the revenue paid by the tenant-owners is more than sufficient to defray the cost of operating the building. In a very brief period the proposed purchaser in one of those enterprises has a trustworthy statement which will enable him to decide as to whether or not he is justified in making his investment. In those types which represent the best plan of organization an investor would find that by becoming an owner his savings in rent over what he would pay to a commercial landlord would be at least equivalent to 12 per cent a year on the amount of money invested. The test of the proposal would be that if the owner made his investment and did not occupy the apartment in connection with his purchase, he would be able to find a tenant who would pay him a rent which, after deducting the sum to be paid to the company, the stock of which he purchased, would leave him a return of 12 per cent a year on his money."

The working out of the financial aspect of a project such as this requires care, and to those who are making a study of this subject some of the cost maintenance and rental figures on this new building, 136 East 67th street, will be of interest. The total cost of the building to the tenant-owners, including land, construction costs, architects' fees, and a reasonable profit for the promoters, amounted to $630,000. A first mortgage was placed on this building for $300,000. The equity of $330,000 represented in this transaction is the amount of stock issued to tenant-owners, divided in accordance with the character and size of various apartments. In order to show how this division was made a tabulation is presented showing the price of each apartment in the building. This price represents the owner's share in the equity above his proportion of the first mortgage. In this tabulation the yearly proprietary rentals are also shown. These are determined by estimating the total operating expense for the building, in this manner:

Interest on $300,000 mortgage at 6%	$18,000
Taxes on $480,000 less $185,000, or on $295,000 at 3%	8,850
Coal	2,400
Insurance (fire and general)	700
Operating force	5,280
Supplies	500
Water, light and power	1,000
Management	1,300
Amortization of mortgage annually at 3%	9,000
Contingencies	2,470
Aggregate of annual proprietary rents	$49,500



Typical Floor Plan, Co-operative Apartment House
485 Park Avenue, New York

Here is a tabulation showing individual apartment costs and proprietary rentals:

Designation	Number of rooms	Number of square feet	Price	Yearly proprietary rental
A-1	6 rms.—2 baths	1510	$11,300	$1,695
B-1	4 " —1 "	1035	7,700	1,155
C-1	4 " —1 "	970	7,300	1,095
D-1	3 " —1 "	575	4,300	645
E-1	3 " —1 "	575	4,300	645
F-1	4 " —1 "	970	7,300	1,095
G-1	4 " —1 "	1035	7,700	1,155
H-1	6 " —2 "	1510	11,300	1,695
A-2	6 rms.—2 baths	1510	12,000	1,800
B-2	4 " —1 "	1035	8,100	1,215
C-2	4 " —1 "	970	7,700	1,155
D-2	4 " —1 "	765	6,100	915
E-2	4 " —1 "	765	6,100	915
F-2	4 " —1 "	970	7,700	1,155
G-2	4 " —1 "	1035	8,100	1,215
H-2	6 " —2 "	1510	12,000	1,800
A-3	6 rms.—2 baths	1510	12,600	1,890
B-3	4 " —1 "	1035	8,600	1,290
C-3	4 " —1 "	970	8,000	1,200
D-3	4 " —1 "	765	6,400	960
E-3	4 " —1 "	765	6,400	960
F-3	4 " —1 "	970	8,000	1,200
G-3	4 " —1 "	1035	8,600	1,290
H-3	6 " —2 "	1510	12,600	1,890
A-4	6 rms.—2 baths	1510	13,200	1,980
B-4	4 " —1 "	1035	9,000	1,350
C-4	4 " —1 "	970	8,500	1,275
D-4	4 " —1 "	765	6,700	1,005
E-4	4 " —1 "	765	6,700	1,005
F-4	4 " —1 "	970	8,500	1,275
G-4	4 " —1 "	1035	9,000	1,350
H-4	6 " —2 "	1510	13,200	1,980
A-5	3 rms.—1 bath	1030	9,600	1,440
B-5	4 " —1 "	1300	12,200	1,830
C-5	6 " —2 "	1225	11,500	1,725
D-5	4 " —1 "	1300	12,100	1,815
E-5	3 " —1 "	1015	9,600	1,440

The proprietary rents in the aggregate cover all running expenses and amortization of mortgage.

The subscriptions of prospective tenant-owners in this operation were made payable upon this schedule:

		Per cent
1.	On signing	10
2.	When title is vested in owning company	15
3.	When foundations are completed, not sooner than one month after last payment	15
4.	When concrete work of floor for second story of building is in place, not sooner than one month after last payment	10
5.	When concrete work of the floor for the fourth story of the building is in place, not sooner than one month after last payment	15
6.	When roof is on the building, not sooner than one month after last payment	10
7.	When brown coat of plaster is on the building, not sooner than one month after last payment	15
8.	On completion of building	10
		100

Another interesting co-operative apartment building which has just been completed in New York is the structure at 485 Park avenue, developed under the management of Douglas Elliman & Company. Here again experience has shown the soundness of the 100 per cent plan. In this connection Mr. Elliman is authority for the statement that "co-operative apartment house ownership is tenant ownership. It does not mean that you buy an apartment simply, but that you actually invest with others in real estate. The inducement lies in the saving in rental. The only dangers are in trying to get too much out of the investment and in improper management. As an example, a man buys a co-operative apartment, say for $10,000. Assuming that he had invested that amount at 6 per cent, which would be a fair supposition, his interest would have been $600 a year on that amount. The upkeep of the apartment would be about $1,000 a year.

Kitchen

Sun Parlor

Typical Interiors in Hawthorne Court Apartments, Jackson Heights, New York
George H. Wells, Architect

Adding the $600 interest would make a total of $1,600, which he would charge to one account. The theoretical rental value of the apartment would be, according to the average of our experience, approximately $3,200 a year. Consequently he would save 30 to 50 per cent on his rental. His profit would be the difference between $1,600 and $3,200 or $1,600."

The total cost to the tenant-owners of the building at 485 Park avenue was $1,100,000. Of this amount $540,000 is in the form of a first mortgage, and the balance, or $560,000, is represented in stock.

As will be noted by reference to the floor plan presented herewith, these are large apartments, arranged two to a floor, excepting on the eleventh, twelfth and fourteenth floors which are occupied entirely by one apartment each. The typical apartment A represents an investment by the tenant-owner of $26,000. His proprietary rental is $3,120 per year for an apartment which has an approximate rental value of $6,500 per year. Apartment B represents an investment of $22,400, carries a proprietary rental of $2,688, and has a market rental value of approximately $5,600. In estimating the proprietary rental the total expenses of carrying this building are:

Estimated annual expenses:	
Labor	
2 doormen at $80	$1,920
2 passenger elevator men at $75	1,800
2 service elevator men at	1,800
1 night fireman at	1,200
1 day fireman at	900
1 porter at	960
1 superintendent at	1,800
	$10,380
Lay-off in summer	1,040
	$9,340
Fuel	$3,500
Electricity (net)	1,000
Water	500
Supplies	250
Repairs and decorations	3,500
Insurance	1,100
Administration	5,000
Gas	50
Miscellaneous	2,000
Total operating expenses	$26,240
Taxes (estimated)	$18,000
Interest on first mortgage	32,400
Estimated total expenses	$76,640

Progress at Jackson Heights

In the last two years there have been a number of interesting developments in connection with the great co-operative apartment development of The Queensboro Corporation at Jackson Heights, New York. These buildings, some of which are illustrated in connection with this article, and others designed by Andrew J. Thomas in previous issues, represent still more interesting types of architecture and construction than earlier structures in this development. In line with increased building costs the management of this corporation wisely decided that the more expensive type of apartment was in order, and no pains have been spared to develop a high standard of attractiveness and living comfort.

Commenting on the experience of his organization, F. R. Howe, Vice-President of The Queensboro Corporation, has made claim that when "certain fundamental conditions are observed, tenant-ownership of apartments shows a greater economy with equal comfort as compared either with the ownership of a house or with the out and out rental of an apartment. These fundamental conditions are thus briefly presented:

1. A fair price.
2. Safe financing.
3. A neighborhood of established or growing values.
4. Careful selection of tenant-owners, to insure harmonious relations.
5. Expert management.

"Reviewing these conditions as they affect Jackson Heights, first with regard to price: The policy of the building up of Jackson Heights has been to charge a fair or normal profit on a large number of buildings, rather than to attempt to make a large profit out of each particular group. The soundness of such a conservative policy has resulted in the fact that many of the tenant-owners at Jackson Heights who have been forced to move to other cities have been able to sell their interests at substantial profits, and they have all made substantial savings by becoming tenant-owners since the inauguration of the plan in the summer of 1919.

"Sound financing of apartment buildings is the same as in other investment enterprises; the relation of the mortgage indebtedness to the entire investment should not exceed one-half, or at the most 60 per cent. At Jackson Heights one-half has never been exceeded, and in some cases the mortgage has been for considerably less than one-half of the value of the enterprise. One of the greatest abuses that tenant-ownership has been subject to has been overloading the properties with two and three, and in some instances four mortgages, which places the purchaser in the same position as the 'shoestring' margin trader in Wall street—the first puff of adversity wipes him out.

"The stability of the neighborhood as a residential district is of great importance to investors in co-operative apartments, and when the neighborhood is of steadily increasing value, the investment is more certain to appreciate with the growth of the neighborhood. Such a condition is presented by the development at Jackson Heights. Starting a few years ago with three or four 5-story apartments, now more than 100 apartment buildings have been constructed or are in course of erection. The careful selection of tenant-owners is a *sine qua non* of successful tenant-ownership. Rigid examination of business and social references is an essential point where people are collective owners of apartments, and nowhere has greater care been used than at Jackson Heights, where in the selection of over 700

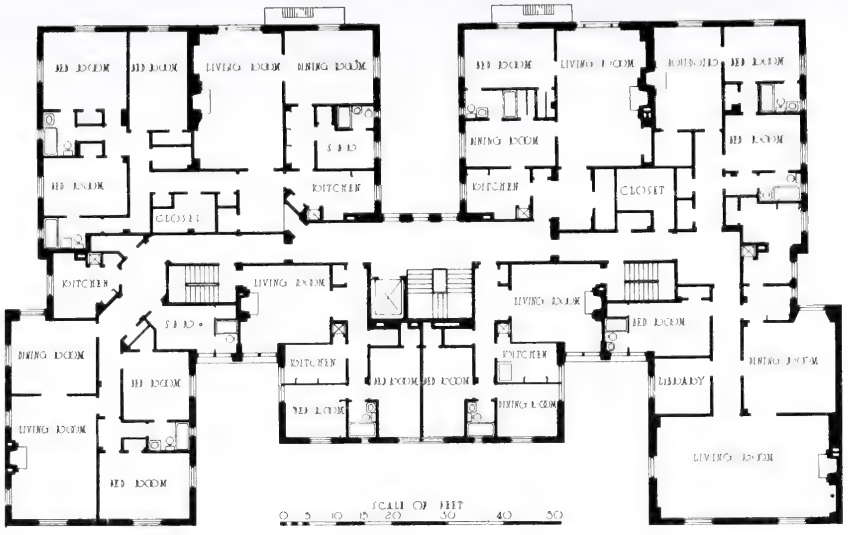
GENERAL EXTERIOR VIEW

DETAIL VIEW OF UPPER STORIES

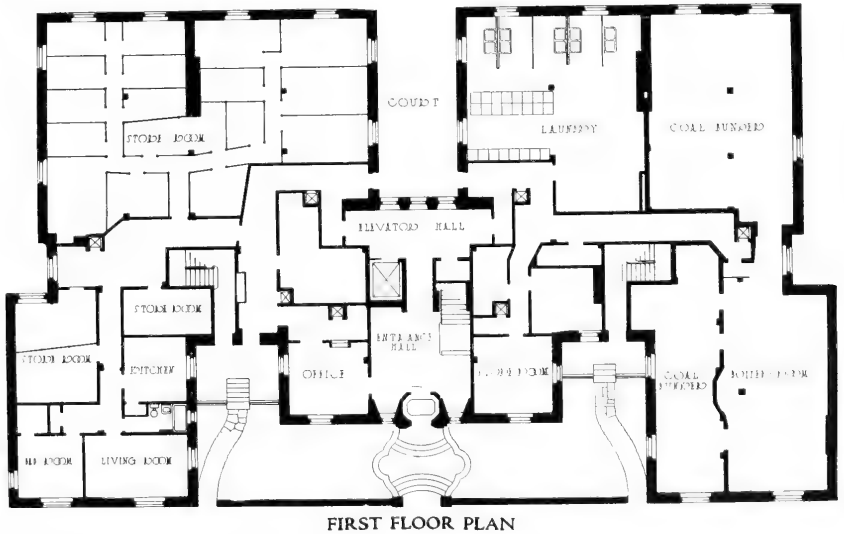
CO-OPERATIVE APARTMENT HOUSE, 136 EAST 67TH STREET, NEW YORK

WALKER & GILLETTE, ARCHITECTS

DETAIL OF ENTRANCE



SECOND FLOOR PLAN



FIRST FLOOR PLAN

CO-OPERATIVE APARTMENT HOUSE, 136 EAST 67TH STREET, NEW YORK

WALKER & GILLETTE, ARCHITECTS

present tenant-owners not one mistake has been made in admitting an undesirable owner.

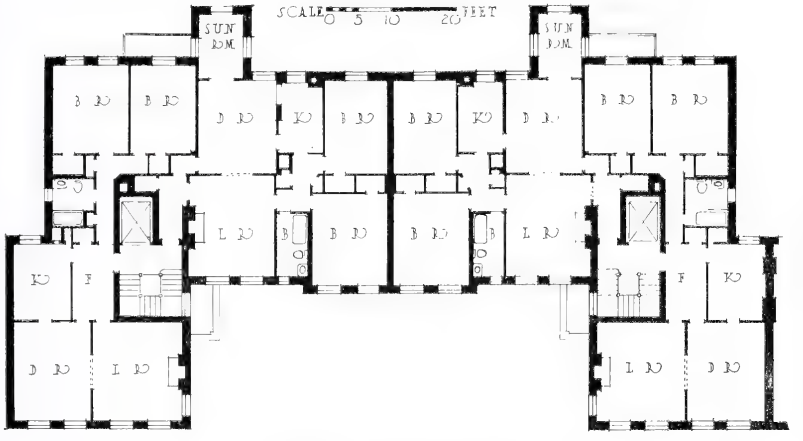
"Many co-operative apartment houses starting out with good financial plans and careful selection of owners have come to grief through amateur management. The business of apartment management is just as much a business as factory management. It should be in expert hands. Like factory management, large scale operations secure reductions in cost. At Jackson Heights The Queensboro Corporation manages the entire enterprise. Over one hundred 4- and 5-story apartment houses in one neighborhood are managed by this corporation, so that large economies are effected in the purchase of such items as coal and in the general direction of the enterprise.

"Recent figures covering the sale of stock representing a high class apartment in one of the new buildings at Jackson Heights will be of interest for comparative purposes. The apartment taken as an example is a 7-room and 3-bath apartment which is one of eleven apartments in a 5- and 6-story elevator building which is priced at $213,000 and in which the mortgage is only one-third of the cost. Here the running expenses, including elevator service, janitor service, light, heat, etc., are estimated at $3,400, and the fixed charges, including taxes in excess of exemption, interest, insurance and management amount to $7,000.

"In determining the quota to be paid by tenant-owners, there was added $2,100 amortization on the mortgage, which is at the rate of 3 per cent per annum, and $850 as a reserve to meet contingencies.

"Turning now to the individual apartment. This apartment could not be rented elsewhere in New York at the present time under from $3,000 to $4,000. The cost to buy is $13,000, which represents its share of the equity in the entire building. It may be purchased under the installment plan by paying down a minimum payment of $3,500 and paying the balance as rent. This balance includes all of the foregoing items of upkeep, fixed charges, etc., and is $103 per month. $123 is the monthly installment, including interest on the deferred balance, making a total of $226 per month or $2,700 per year."

These payments will purchase the entire equity of the apartment, valued at $13,000, in eight years. Comparing this with an apartment renting for $3,000 per annum, in eight years there would have been paid $24,000 as rent. Under the installment tenant-ownership plan, in addi-



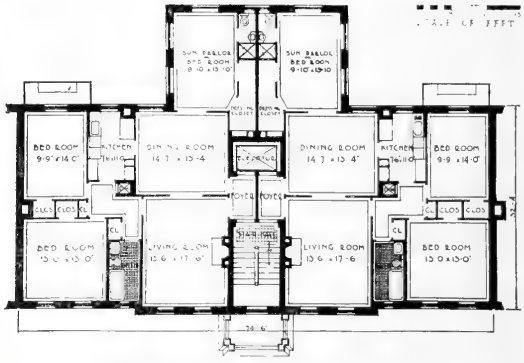
Typical Floor Plan of Laburnham Court

Co-operative Apartment House Group, Jackson Heights, New York

Exterior of Laburnham Court Apartments and Community Tennis Courts

George H. Wells, Architect

Rear View, Showing Garden Treatment in Center of Block
Jackson Heights, New York



Typical Floor Plan, Hawthorne Court

tion to the $3,500 initial payment there would have been paid to meet running expenses, interest, insurance and installments, $25,196 in eight years.

The result in one case is the ownership of nothing; in the other case, the full paid ownership of an equity of $13,000 and the reduction by 24 per cent in the share of the mortgage upon the building, which is $1,600 reduction for this one apartment; furthermore, a payment into reserve for contingencies of over $600 is effected for this one apartment, and in addition the incalculable amount of saving due to a possible reduction in the future in the cost of operating the buildings, all of which accrues to the tenant-owner, so that with every decline in the cost of operation there is increased saving.

One more fact is interesting to know in this connection. Under the original sales plan of Jackson Heights the owner's rental of an apartment was established at a high enough figure to make it possible to pay 7 per cent interest on the stock representing tenants. Within the past two years it has been deemed wise to eliminate this interest feature and to charge an owner's rental only sufficient to cover running expenses. This has been done for two reasons: first, because the 7 per cent return to the owner in the form of interest on his bonds offered taxation difficulties, and, secondly, because this action withdrew a complication in the sales plan, for the more simple a sales plan for promoting a co-operative venture can be made the more readily will success be attained.

In this series of articles the most important details of a successful co-operation project have been covered, but each operation involves individual consideration and presents specific problems, in solving which a special service is offered to readers.—The Editor.

Exterior of Hawthorne Court Apartments, Jackson Heights, New York
George H. Wells, Architect

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

The Hotel or Restaurant Kitchen

By N. W. ALDRICH

PROMPT and smoothly running service, upon which depends the success of a restaurant or a hotel dining room, is almost entirely a matter of its being served by well equipped and well arranged kitchen and other service quarters. An examination of a successful restaurant kitchen will show that it has been so planned and organized that it becomes a kind of mechanism, not readily thrown out of balance by unexpected demands upon it.

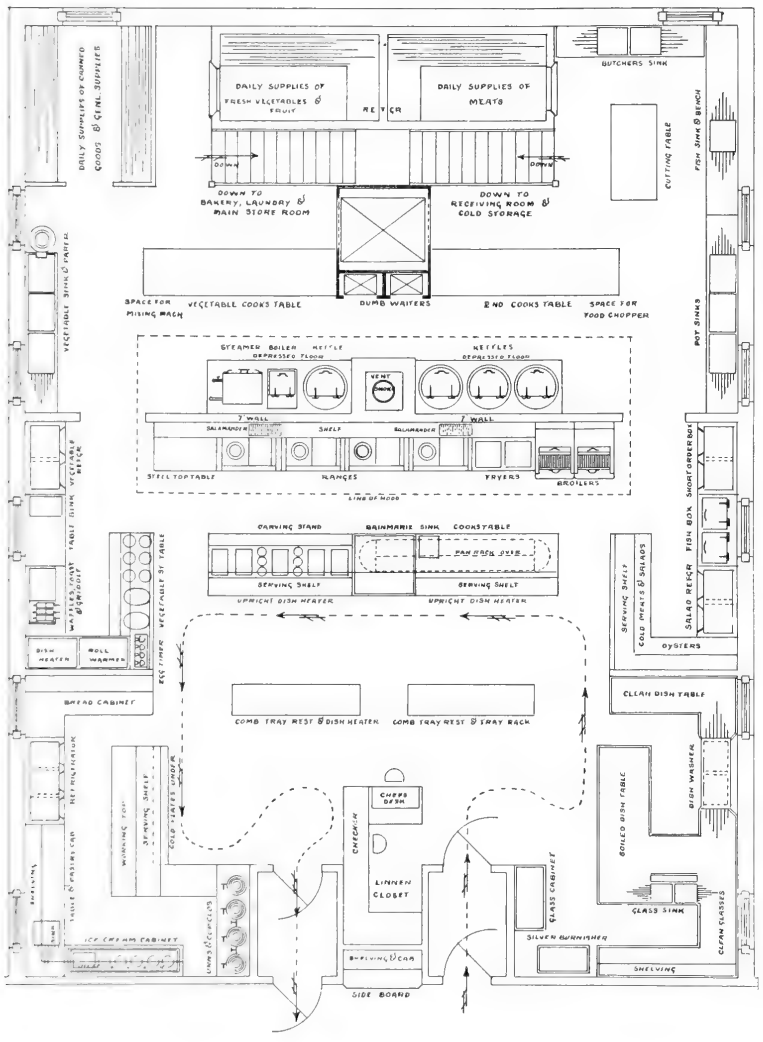
To make plain what is meant by a well planned and equipped restaurant kitchen a diagram is given which may serve to illustrate the suggested layout. While the plan will to a certain extent explain itself, it is the writer's aim to explain how important it is to bring such departments as are shown on the plan, and especially those in the serving department, as near as possible to the dining room.

It would be almost impossible to give the exact capacity of such a kitchen, owing to the fact that this depends wholly upon its supervision. Stewards as a rule are accustomed to certain ways of running their departments, and some of the most competent in their line may not be familiar with or understand plans as well as an architect or engineer who would consider it his duty to see that such plans are thoroughly understood. Relative to capacity, however, this kitchen with proper supervision should be large enough for the dining room of a medium sized hotel, say of 400 to 500 rooms, or for a restaurant with a seating capacity of from 300 to 400. With the limited amount of space available for this kitchen, say 45 x 60 feet, the receiving room, storeroom, bakery, laundry, employes' dining rooms, etc., are located on the floor below and should be properly lighted and ventilated.

Although it is not advisable to recommend every kind of apparatus that may be used in kitchens without first consulting the owners, managers or stewards, care should be taken that space be allowed for such fixtures in order that these may be installed at a later date without interference with the more essential details which are already in place. The section of the kitchen where dishes, silver and glass are washed should be so arranged that waiters or 'bus boys may deposit used dishes at soiled dish tables without interference with those working in this department. A large soiled dish table should be so arranged that glasses and silver as well as dishes may be cared for in this corner of the kitchen. Dishes should pass through a dish washing machine to the clean dish table where they are assorted and placed in heaters or on shelves, and glass should pass in an opposite direction to glass washer or glass sink and be dried ready to return to cabinet or dining room. Silver may be washed in the same machine as dishes and then passed to where it is sorted and dried, but as dish water is always greasy, glasses should be washed either in a separate machine or a double sink. They never look bright and shiny unless properly wiped. A silver burnisher will also be found practical, and since it is considered one of the essentials, like the machines for cleaning and polishing steel knives, space has been allowed for all these details on the plan. The oyster bar and bar or counters for salads and cold meats, together with a short order or cut meat box and sea food chest, are so arranged that a shortage of help would not cripple the service as it would if these departments were scattered, and waiters ordering from these departments are served over the shelf at convenient height above the working top of the salad bar. The combination feature, including cook's table, bain marie and carving stand, is so located and equipped with upright dish heater that several waiters may be served at the same time without interference, the top of the dish heater being used as a serving shelf and the two tables in the center of the floor being useful for resting trays while loading as well as for warm dishes and clean tray rack.

The section where the vegetable cook performs her duty while serving is provided with steam table, roll warmer, dish heater, table, and combination griddle, toaster and waffle iron; also with sink and refrigerator for cooked vegetables. The egg timer is so located that the waiters themselves may attend to boiling eggs at breakfast time. This vegetable steam table should be provided with dish heaters, under the table as well as overhead, and a serving shelf with space under the roll warmer arranged for storage purposes.

Next in line we have the serving pantry, equipped with bread and pastry cabinets; a refrigerator for fruits, dairy products, etc.; sink; ice cream cabinet; urns and urn stand with cup closets, and serving counters, equipped with overhead shelves; drawers and shelving on the working side, and narrow shelves for cold plates and possibly silver boxes on the service side. By carefully planning this serving pantry



there will be found shelf room enough to care for quantities of dishes, tea and coffee pots, etc., as well as food, and sufficient amounts of both should be stored for each serving period.

By locating the checker's desk in the center of the kitchen it will be possible for her to observe the service as well as performing her duty as checker.

Going to the rear of the kitchen, or at the back of the cook's table and carving stand, where ranges, broilers, kettles and steamers are installed, there is in this case a tile wall dividing the ranges and broilers where order cooking is done from the steam fixtures. It is not necessary for this wall to be more than 6 feet high, excepting of course at the vent stack located in the center. A large canopy or hood covering these fixtures should carry off the greater part of the smoke, steam and fumes, and where coal ranges are used for cooking, a steel stack enclosed in vent stack as shown on the plan would provide natural draft which in most cases is sufficient. The floor under the steam fixtures should be depressed and properly drained in order that it may be kept clean. Other floor drains are important, but should be so located that they will not interfere with service. The butcher shop, where daily supplies of meat, fish, etc., are prepared, is conveniently located and can on short notice replenish the cut meat or fish supply for the cook.

The opposite side of the room, used for preparing and cooking vegetables, is but a few steps from the station where they are served. Space for the mixing machine, food chopper and other extra equipment may easily be obtained in this room, and with elevator and dumb-waiters as well as stairways to other auxiliary departments, this kitchen should prove itself to be both practical and economical.

In many cases where space is available it is considered more practical to have the various branches partitioned or separated. In such cases there are separate rooms for washing dishes and glass and also a silver room which will of course keep one person busy all of the time, and many more part of the time, especially if out of sight of the steward or chef.

No doubt the larger kitchens may be looked upon from a different standpoint, owing to the fact that each of these units is of such size that a much larger force is required for operating. The same principle, however, applies in both cases, and in this particular case the object in view is to show a kitchen of medium capacity which can be operated at minimum cost and at the same time produce quick service.

Aside from the steward and his assistant, such a kitchen should be operated with the minimum number of attendants: chef and second cook; two broiler and fry cooks; roast cook; two butchers; two salad men; two oyster men; a vegetable cook with four assistants; four girls in the serving pantry; twelve employed in washing dishes, glass and silver; two general kitchen men, and two checkers. This is based on giving full hotel service where two shifts are required, and aside from extra work at the carving stand this number should be sufficient to care for banquets as well as for regular dining room service. This combined service unit, together with a properly organized dining room force, should be a guarantee of good service in every respect.

Providing a lunch room or cafeteria is installed, whereby this kitchen is depended upon for supplies, care should be taken in order that such a department be so connected with the kitchen that its service would in no way conflict with that of the dining room. In most cases where this department would be on a separate floor, elevators and dumb-waiters will add all necessary convenience.

Electrical Wiring Layouts for Schools

(CONCLUDED)

By NELSON C. ROSS, *Associate Member, A.I.E.E.*

IN laying out the plans for the wiring of a school building the highly important subject of supplying power for the operation of various utilities must not be overlooked. These utilities are each year becoming more complex, and provision should be made for all immediate needs as well as for such possible future requirements as can be foreseen.

Motor Circuits and Power Wiring. Motors will be required throughout the building for the operation of ventilating fans, pumps, elevators, machine tools and other equipment. These motors are as a rule supplied by the contractors furnishing this equipment, but all wiring of the motors should be included under the wiring contract.

The motor circuits should be independent in all ways of the lighting circuits, excepting where motors of fractional horsepowers are to be used; such motors, however, should be of the single-phase type and wired for operation on 110 volts. They may be permanently connected to branch circuits from the lighting panels, or as portable equipment may be operated from any socket or receptacle on the lighting circuits. With direct current, each motor circuit requires two wires; with single-phase alternating current, two wires; with three-phase alternating current three wires, and with two-phase alternating current three or four wires, depending upon transformer connections.

With direct current, the voltage of the motor circuits will be either 110 or 220 volts; with alternating current either 220-440 or 550 volts, 60-cycle current, and it is of importance that the voltage, frequency and phase of the available motor current should be known before the work is laid out. All motor circuits should be installed in separate conduits and should be fed from the service switchboard, either singly, as in the case with large motors, or in groups where several motors are fed from one power main or riser.

With few exceptions, large school buildings will have two different service connections, one for the lighting service at single-phase, 110-220 volts, three-wire system, and another for the power service at the available motor voltage, either two- or three-phase current. An exception to this rule may be where the power company has not a three-phase or power line near the building, in which case it is sometimes necessary to use single-phase current, with the power company's permission, even on motors of large capacity. As a rule, however, single-phase motors of more than 2 or 3 horsepower in individual motors must not be installed and connected to the service.

Where the motor voltage is 220 volts or less, on any system, the smaller motors may be satisfactorily operated from the power circuits; where, however, the motor voltage is 440 or 550 volts, it is not advisable to operate any portable equipment, or motors of fractional horsepowers, and such small motors should be connected with the lighting service. This also applies to motors for the operation of the machines in the lunch room and kitchen, such as the dish washer, potato peeler, meat grinder, etc., as well as any machines and equipment that may be directly used by the instructors and pupils; when this is done, the specifications should call for single-phase motors for these machines, etc., for operation on either 110 or 220 volts.

Fans for the ventilation of toilet sections may be located on the roof, in an attic space, or elsewhere as may be convenient. Where so located, and where there is sufficient room to install controlling apparatus, the motors should always be operated from the power circuit. Where such vent fans are of the "ready to run" type and are located directly in the toilet section, it is at times advisable to use single-phase motors on these fans, even of as large as 1½ horsepower, and to operate these motors from the lighting circuits, as this permits the starting and stopping of the motor by means of a flush switch of the lock type, set in the wall adjacent to the location of the fan. As these motors are in reach of the pupils, there is then no danger from the higher motor voltage that may be used on the power circuits throughout the building. This also applies to the small motors used for the ventilation of vent hoods in the chemical laboratory or for special laboratory equipment.

All motors throughout the building, and not included under the electrical contract, should be furnished and set in position ready for wiring by the proper contractor. All controlling equipment, such as speed controllers, compensators or automatic starters should be included with the motors. The wiring contract should as a rule include the mounting in position of all such controllers, etc., as well as all wiring to and between the motors and controllers to make the work complete. In the event that slate backs or bases are not included with the controllers, and such controllers are to be mounted on or supported on wood or on plastered walls, the wiring contract should include the furnishing and installation of these slate bases as required by the code. The wiring contract should also include the furnishing and installation of a fused knife switch at each motor, this switch to be of the proper capacity to protect the motor.

With a motor voltage of 220 volts, a standard slate based open type knife switch may be used at the motors. For years, however, it has been the writer's practice to require that these switches and fuses be enclosed in steel cabinets, or to make use of any of the standard externally operated safety switches, as this makes a better installation and

does away with the danger of electric shock or burns due to accidental contact with the current-carrying parts of the switches and fuses. With the use of 550 volts, however, open switches should not be considered, but some type of 550-volt safety switch should be used at all motors; this is of importance, as aside from the question of good construction, or safety in the operation of the motors and equipment, the rules of different cities will arbitrarily require the installation of safety switches on this voltage.

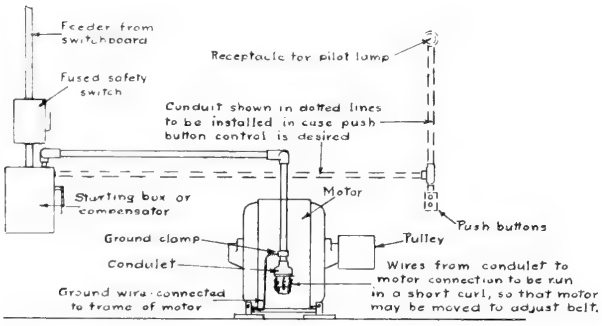


DIAGRAM SHOWING CONNECTION OF SAFETY SWITCH-COMPENSATOR AND MOTOR

In general, the construction at the motor should be "under iron," that is the feeding conduit should terminate in the steel box of the motor switch, conduits passing also between the switch and starter, or compensator, and from the starter to the motor. Where the starter is not of the enclosed type, the conduit may terminate in a condulet or similar fitting, the wires passing through holes in the porcelain cap of the fitting direct to the terminals. Where the motor is of the direct connected type, the conduits may be made up with a rigid connection to the motor, but where belted motors are used, the conduit must terminate in a condulet or similar fitting as just noted, the wires passing from the fitting in a curl to the terminals on the motor, sufficient length being left on the wires to permit the motor's being moved on the belt rails or base, to allow for the tightening of the belt.

In the mounting of speed controllers on fan motors, particularly where such motors and equipment are installed in connection with air-washers, the controller should be set up on the wall and not on the floor. It is further advisable that the conduits and wires from the switchboard to the controllers and from the controllers to the motors should be run "up and over" rather than under the floor, so as to avoid trouble on the circuits due to a ruptured water pipe or to some other accident to the air-washer equipment.

As ventilating equipment may be located on the roof or in attic space, as well as in the basement, and as this apparatus must be operated each day, the question of control should have consideration. The writer is not in favor of remote-control equipment for this work, since if the engineer or janitor must go to each fan in order to put it in operation, he can see that the oil wells are filled, the belts in place and the equipment in proper condition and running at the proper speed, while if this apparatus can be started and stopped from the engine room or other convenient point in the basement, the equipment is very likely to be neglected. If, however, it is desired to control this equipment from a remote point, automatic starters may be located at the motors with controlling push-buttons at points in the basement. Pilot lamps should be installed at the buttons, one to each motor, and so connected that the lamps will glow when the motors are in operation and be canceled when the motors are stopped. No. 14 wire only is required for the controlling circuit. With automatic starting and stopping of the fan equipment, a speed controller of the "pre-set type" is located at the motor, this being set to the speed required. The motor will then run at this speed, under control of the automatic starter; when the speed is to be changed, the engineer must go to the motor and readjust the speed to the desired point.

Another method is sometimes used, consisting of a standard speed controller at the motor, with an underload circuit-breaker connected also in the circuit, a master knife switch being located in the basement at some convenient point. This forces the engineer to go to the motor to start and adjust the speed, but the equipment may be stopped at night by opening the switch in the basement.

Where an elevator is to be used, the hoisting machine may be located on the basement floor, in the attic space, or in a penthouse on the roof. The hoisting equipment, including controller, automatic operating devices, wiring in the car, both for the operation of the car and the car lighting, etc., is included under the elevator contract. The wiring contract should include a separate circuit from the service switchboard to the hoisting machine, and this should terminate in a fused switch with an extension of the circuit from the switch to the location of the controller. All final connections of the circuit with the controller will be made by the elevator contractor. A branch circuit should be carried from one of the lighting panels to a point halfway up the well shaft, terminating in an outlet box at this point in readiness for connection to the flexible lighting cable from the car.

Where equipment is provided for industrial classrooms, such as printing rooms, machine shops, woodworking shops, sheet metal departments, etc., and motor-driven machines are to be used, an accurate layout of the rooms with locations of the machines should be obtained before the wiring plans are completed, as these machines will be grouped throughout the space and the feeding conduits must be run under the floor to the controllers and motors. It is of importance that each industrial department, whether of one or more classrooms, be separately controlled from a panel or switchboard, this kept under lock by the instructor, preventing the tools

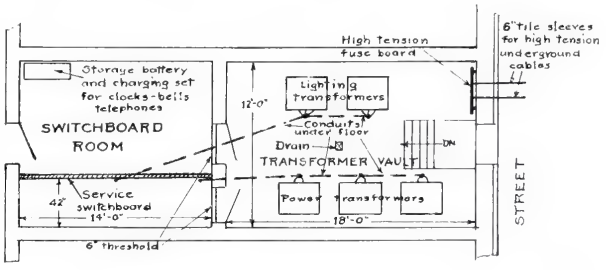
being used by the pupils during the instructor's absence. It is good practice to locate a power panelboard in a steel cabinet at some location convenient to the instructor's desk, this panel being of the standard type and containing fused switches for the control of the different circuits to the machine tools, the cabinet door being fitted with a lock. Where space is permitted but where the development of the industrial equipment is not determined, it is good practice to carry either an empty conduit or a power circuit from the service switchboard to the rooms in question and to terminate this conduit and circuit at a convenient point in the room, either at the ceiling or at a point about 4 feet from the floor, the conduit to be run concealed and terminating approximately 1 inch from the wall. The conduit should be capped and left in readiness for extension of the circuit. This provides a feeder circuit to the room, and the circuit may be extended in exposed conduits to the locations of the motors when the layout is determined. With the use of individual motors this of course means the later cutting of the floor or the installation of the conduits on the ceiling and dropping to the individual motors.

In running circuits from panelboards to the different tools the writer has found it advisable to use a single circuit for motors of 15 horsepower or larger; to use two or three motors of 10 horsepower each on a circuit; five or six motors of 3 horsepower each, and as high as ten or twelve motors of 1 horsepower each. The tools would of course be grouped on the circuits, depending on their types and locations. Thus a large planer would have a single circuit, while two or three small planers, four or five saws, four or five boring machines or drills, or ten to twelve lathes could be grouped on separate circuits from the panelboard. This method of circuiting keeps down the size of the copper and conduits in the floor slabs and provides a flexible equipment, since but few machines will be rendered inoperative by the opening of a fuse; it further permits the instructor to cut out any group of machines at will. The use of floor boxes should be avoided where possible in the installation of machine tools, and the conduit should bend up from the floor in an elbow, the conduit terminating in a fitting well above the floor. This not only provides a waterproof installation, but as the circuit wires are carried above the floor there is ample room to make proper splices and connections.

In proportioning copper for the motor circuits, the full load as well as the starting load must be provided for, and the copper must be heavy enough to take care of the maximum load in amperes. If the starting load on the motor, due to a long line of shafting, or pumps under pressure, is 25 per cent in excess of full load, the copper must be proportioned for the starting load; if, however, a number of motors are connected on one circuit, all of these motors will not start at the same instant, and the feeder copper therefore should be proportioned for the maximum load that may be expected at any one time. This is, as a rule, on general work from 60 to 80 per cent of the connected load of all the motors on the circuit. Where the circuits are long, additional copper must be provided to care for the drop in voltage due to the resistance of the circuits, etc. In school work, however, where all of the motors are located in one building and the runs are comparatively short, copper proportioned for the full load of the motors will be ample.

For direct current work, allow eight amperes per horsepower on motor circuits when operating at 110 volts, and four amperes per horsepower at 220 volts. For alternating current, three-phase circuits the table on the next page will be found of convenience.

Service Connections and Switchboard. With direct current the service cables will run directly from the street mains to the service switchboard, either underground or on poles. With alternating current service (with transformers installed on the street) the lines will be brought in as just described, there being as a rule one single-phase, three-wire service for lighting and a separate three-phase or two-phase service for power. On the larger school buildings it is generally preferred that a transformer vault be located at some point in the basement and transformers for both lighting and power installed in this vault. When this is done the primary service at 2,300 volts is carried into the vault, terminating in oil circuit-breakers, and passing from the breakers to the primary leads of the transformers. The wiring contract should provide for primary cables, usually No. 4 conductor, from the circuit-breakers to the property line, these installed in conduits or with armored cable. The cables from the property line to the primary mains of the service company are installed by the company. The transformers will be furnished and set in position by the company.



DETAIL SHOWING TRANSFORMER VAULT AND SWITCHBOARD ROOM

The transformer vault should be of fireproof construction and should have not less than 40 square feet of floor space for 100 K. V. A. transformer capacity, and it should be larger where transformers of greater capacity are to be used. The vault should have full headroom and should be vented to the outer air with not less than two 6-inch square ventilating ducts.

The service switchboard room should be adjacent to the vault, and it is good practice to arrange the board as shown on the diagram, with a door from

the vault to the rear of the board. This keeps all high tension connections in the vault or opening from the vault, and since the vault is kept locked, even the operator of the board cannot come in contact with the high tension terminals. One panel of the switchboard should be reserved for the watt-hour and demand meters of the service company; the drilling for these meters is to be done from templates furnished by the company. The switchboard should be made up in two sections, one for power and one for lighting service, each fitted with a master switch, and the two service mains running from these service switches to the transformers.

Each feeder from the switchboard to the panelboards, motors, etc., should be mastered from fused switches on the switchboard, the switch and fuses being of the full capacity of the feeder. There should be a separate feeder from the board to the stage panel and lobby panel of the assembly hall, also a separate emergency feeder to the lobby panel controlling the exit and emergency lighting.

There should also be a separate feeder to the panel controlling the lighting of the gymnasium, and separate feeders to the different groups of panels controlling the lighting circuit throughout the corridors. As a rule the corridor panels are grouped on four risers, one at each corner of the building, thus controlling four sections of the building on separate risers.

On the power circuits there should be a separate riser controlling the ventilating equipment in the basement, and also separate risers to such ventilating equipment as may be installed on the roof, to the motors in the industrial departments, the elevator, the motor generator set for the moving picture booth, and the motor-driven equipment in the boiler room.

All switches on the lighting panels of the switchboard may be of the standard open type, the same type being used for the power circuits on 220-volt work. With 550-volt work, however, it is advisable to use back connected oil circuit-breakers on the power panels of the service switchboard.

Recording and indicating instruments are not as a rule used on these switchboards; if it is desired to keep records of the loads and distribution of the current, instruments may be installed on this board and connected in the feeder circuits. These may be of the indicating, recording or chart type as desired.

Riser circuits should be run from the switchboard to the panels of the lighting circuits, and where there is more than one panel connected to the riser the riser should pass through the panels connecting in series, full sized copper being used, for if the copper is reduced from panel to panel it becomes necessary to make use of fuses to protect the smaller conductors, and the cost of the fuses and connections becomes more on these short runs than the cost of the full sized copper.

Riser circuits should be proportioned on three-wire, 220-volt circuits for 4.7 amperes per kw. connected load, three wires of the same size being used for each riser circuit.

TABLE FOR PROPORTIONING COPPER IN MOTOR CIRCUITS WITH ALTERNATING CURRENTS

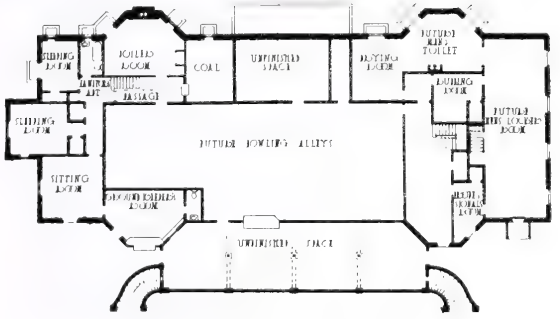
H.P.	Approx. full load current in amperes	Amperes of starting fuses	Amperes of running fuses	Amperes of switch	Size of wire
110-volt circuits					
1	6	15	10	30	No. 14
2	12	25	20	30	12
3	18	35	25	30	8
5	30	60	40	60	6
7½	42	80	60	100	4
10	56	100	75	100	2
15	84	150	125	200	0
20	104	200	150	200	00
30	156	250	200	200	300,000 C.M.
220-volt circuits					
1	3	10	6	30	No. 14
2	6	15	10	30	14
3	9	20	15	30	12
5	15	30	20	30	10
7½	21	40	30	60	8
10	28	60	40	60	6
15	42	80	60	100	4
20	52	100	75	100	2
30	78	150	125	200	0

In certain districts a three-wire, 110-220-volt lighting service may not be available, in which case all feeder circuits are developed on a 110-volt, two-wire system. These feeders must be proportioned for 10 amperes per kw. connected load, and the copper should be sized for approximately 80 per cent of the total connected lighting load of the building. Two wires are used (of the same size) for all feeder circuits.

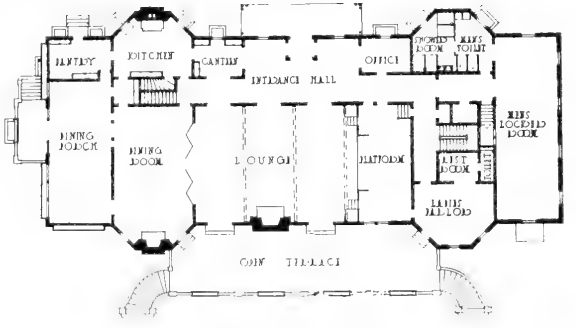
Conduits containing the feeder circuits should be run exposed on the ceiling of the basement corridors or concealed in the first floor slab, rather than under the floor, in order to avoid pockets that may contain moisture. As a rule, these conduits may be run in the duct spaces in the basement corridors, either at the sides of the heat and vent ducts, or in the galvanized iron vent ducts, passing out through the sides of the ducts at the panelboards.

Where, due to building construction, it becomes advisable to install the feeder conduits under the floor of the basement, and where there is any liability of there being moisture, the feeder circuits should be sheathed with lead in addition to the regular rubber insulation. A steel junction or splicing box must be used at the point where the leaded wires connect with the riser circuits, this located in an accessible location in the basement corridor, unless the construction permits the leaded wires to be carried into the cabinet of the first panelboard without splices, in which case the lead may be laid back and the wires connected direct to the terminals of the buss bars of the first panelboard.

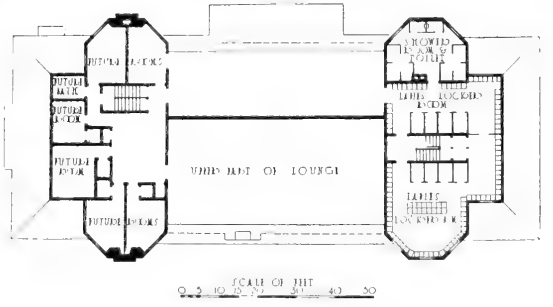
GENERAL VIEW FROM TENNIS COURTS



BASEMENT FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

LONGWOOD CRICKET CLUB, CHESTNUT HILL, MASS.

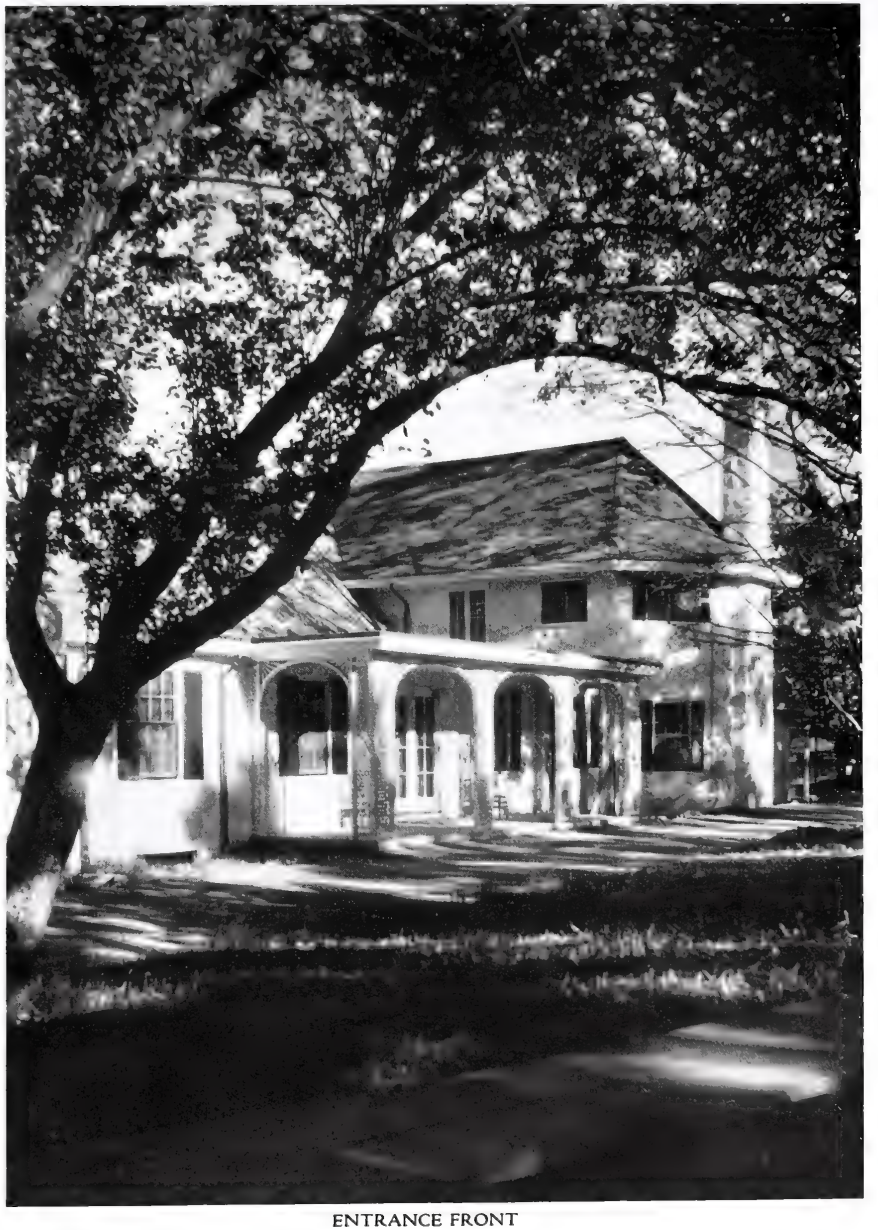
PUTNAM & COX, ARCHITECTS

DETAIL OF COURT SIDE

LONGWOOD CRICKET CLUB, CHESTNUT HILL, MASS.

PUTNAM & COX, ARCHITECTS

DETAIL OF BAY



ENTRANCE FRONT

LONGWOOD CRICKET CLUB, CHESTNUT HILL, MASS.

PUTNAM & COX, ARCHITECTS

DINING AND CARD ROOM

LOUNGE ROOM

LONGWOOD CRICKET CLUB, CHESTNUT HILL, MASS.

PUTNAM & COX, ARCHITECTS

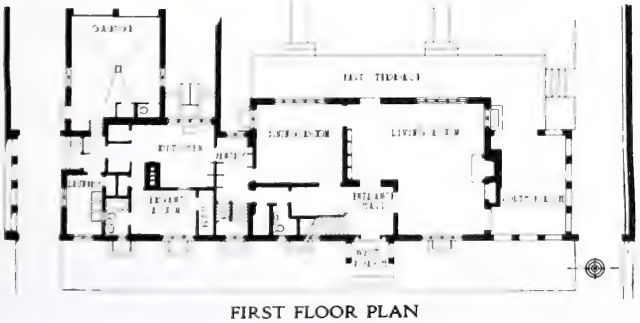
VIEW OF ENTRANCE FRONT

VIEW FROM THE GARDEN

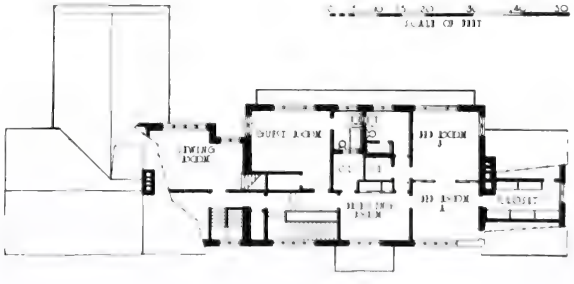
HOUSE OF ARTHUR S. PARKS, ESQ., WICHITA, KAN.

MYRON HUNT, ARCHITECT

DETAIL OF ENTRANCE



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF ARTHUR S. PARKS, ESQ., WICHITA, KAN.

MYRON HUNT, ARCHITECT

Concrete Construction

V. CONCRETE IN THE OFFICE

By WALTER W. CLIFFORD, *of Clifford & Roeblad, Engineers*

DESIGN computations, drawings, and specifications comprise the office end of concrete construction. Like the field work, they vary somewhat in practice from other departments of building work.

System in design computations for concrete is of great importance, because practically every concrete member requires as many computations as a steel plate girder. In a concrete beam, for example, the exterior moment must ordinarily be computed at points of positive and negative moment and often at other points to locate the cambers; the shear must be computed at several points in order to space the stirrups, and the rods must be selected for suitable combinations, top and bottom, and for compression steel at the support. After the solution is reached, it cannot be expressed to the draftsman by a simple reference to a standard section, but must be shown in a sketch or the information must be tabulated. Furthermore, grades of material and allowable stresses are not standardized in concrete, and to facilitate a review of computations or later reference thereto, clear presentation of fundamental data is essential. All this work may be done with the utmost neatness, yet if it is arranged in a haphazard manner it will be a tedious process to find all the desired information, and the possibility of there being omitted data is great.

Systematic computations are most easily made by the aid of a printed form. Such a form is a real economy for all offices where design computations are made regularly, and a necessity in offices where computations are likely to be used by several men. In the small offices where one man makes design, drawings and specifications, a form is less important, but even there it is needful to have the data clearly arranged for future reference, and a simple office computation sheet with a heading which has blanks for loadings and unit stresses is worth while.

Design sheets are usually made letter size, and it assists most of us in our striving for neatness in computations to have the sheet quadrilled. In the heading at the top of the sheet, besides the firm name, there are usually blank spaces for the job's name or number, the initials of the designer and the checker, the date, the sheet number, a blank line for "Remarks," such as "Scheme A" or "Four-story design," and a space for the subject of the computation. Next in order of sequence and position comes a tabulation of the data. Space is allowed for "fc" (allowable compression in the concrete), "fs" (allowable tension in the steel), "n" (ratio of the moduli of elasticity), "v" (allowable shear), and "u" (allowable bond stress), and sometimes "R" (coefficient of resistance) and "p" (percentage of steel) if these are customarily used. For the small offices, where it is desirable to use one computation form for all classes of work, such a sheet is sufficient. It can be used for wood, steel or concrete, and the results can be shown by a sketch or notation at the bottom of the sheet.

Where sufficient work is done to warrant separate design forms for beams, columns, and miscellaneous members, more can be advantageously added to the form. On beam sheets there should be added to the data blanks spaces for the live load, various parts of the dead load, and the panel width. The center-to-center span and clear span should also be included, unless they are already accounted for in a printed design sketch. In the body of the sheet printed forms for the various routine computations, such as "M = ———— = ft. lbs." may be included at the option of the individual. Finally comes the statement of the results which may be in tabular form, in a sketch or by a combination of the two methods. Probably the most satisfactory method is to have a sketch similar to that shown in Fig. 1. The rods as used can be quickly drawn in over the dotted template lines; intersecting beams can be shown (and dimensioned on the top dimension line), and the sketch used as a load diagram. As actually used the sketch shown is made the full width of the computation paper. Even so, it is rather small to take all the stirrup dimensions, and they can be easily shown in tabular form as:

"Stirrup spacing from the face of left support ....."

"Stirrup spacing from the face of right support ....."

For columns a different type of sheet is needed, and something like that shown in part in Fig. 2 is very satisfactory. Concrete members, aside from beams and columns, vary so greatly that the simple sheet with heading and blank spaces for stresses is most satisfactory, although some offices have special forms for footing design.

To many who have not used them, design forms may seem a needless expense, but aside from the saving in time by having desired information quickly available and insuring against omissions, printing is immensely cheaper than handwork, and the money saved in printing the regularly used words and lines is large.

After computations come drawings. Concrete drawings are of two kinds,—assembly drawings and details. Owing to lack of standardization and other considerations mentioned in a previous article on design, concrete cannot be turned over to the contractor to detail as can structural steel. The assembly drawings for concrete work are largely the fram-

ing plans. They show the locations and sizes of columns and beams as well as of openings, and the identification numbers of beams and columns. It is usually practicable to use the framing plan for a slab detail sheet, supplementing it as may be necessary with sections. The bending diagram of slab rods can often be shown directly on the framing plan, thereby saving in large part the drawing of sections. Framing plans are usually drawn at a scale of $\frac{1}{8}$ inch or $\frac{1}{4}$ inch to the foot.

Concrete details should be drawn after the custom of structural steel details rather than by architectural conventions; that is to say each member,—beam or column,—should be considered as a unit and so detailed. The method of taking various and sundry sections through the building and detailing thereon such members as may be visible or nearly visible is not a satisfactory method. Up to the present, at least, concrete details are usually made to scale rather than on template diagrams such as are used so advantageously in steel detailing.

There are some common conventions and customs which make for speed and economy in concrete detailing. The scale of $\frac{1}{2}$ inch to the foot has been found the most satisfactory for concrete details and is almost universally used in the larger organizations. A convention not so universally used as it should be is the use of full heavy lines to indicate reinforcement. The more or less prevalent use of dotted lines for this purpose is probably based upon the idea that concrete reinforcement should be "invisible" since it is back of the surface. The dotted line has actually nothing to recommend it for showing main steel, although it may be effectively used to distinguish the ends of rods belonging to another member but projecting into that being detailed, as shown in Fig. 3. The full line can be drawn more quickly than the dotted line, and where rods cross the latter often leads to ambiguity. Weight of line offers plenty of opportunity for distinction. On framing plans, beams are often shown as heavy single lines, rods as full lines of medium weight, and outlines by a light full line, all being as clear and distinct as they could possibly be if dotted lines were used, and the whole drawing is clearer and more easily read. Another old convention which can be readily improved upon is the use of triangles and dots to indicate concrete in section. This is very interesting when well done, but shading on the back of the tracing with a soft pencil is fully as satisfactory and is much more quickly made. Still another convention—it might almost be called a principle—of concrete detailing is that clear diagraming of reinforcement is much more important than correct orthographic projection; for example, in the elevation of a beam at supports, rods should be separated on the drawing as may be necessary to indicate clearly the outline of each rod, even if they are actually in the same plane. The section and dimensions will locate them in the proper planes.

It is probably better to leave the rod type numbers to the contractor and there is, of course, no need for the architect's giving schedules or complete bending diagrams. The designer must, however, give identification numbers or marks to the beams and columns for his own reference. For this purpose, the co-ordinate system as described in the "Handbook of Building Construction" has many advantages over the old system of consecutive numbering. The details of information which the architect should give, and must give if he is to justify himself as the designer of his work, are the sizes and locations of all main reinforcement, together with the angles and locations of all cambers and bends, and the size, shape and location or spacing of all secondary reinforcement such as stirrups, hoops or spacers. In general, the designer should give such information that the detail bending diagrams and schedules can be made only one way, and then check them to see that they are made in that one way. Certain of the information about auxiliary reinforcing, such as spacer rods in slabs and beams, stirrups where uniformly spaced, column hoops, amount of cover over main reinforcement, number of reinforcing chairs or supports and the lap of column rods, can be covered by suitable notes on the drawings or in the specifications.

The specification is the final item of concrete work in the office. To this chapter of the specification, as well as to the rest, should be applied the three Cs—clearness, completeness, and conciseness. Concrete specifications of the architect are to a considerable degree amenable to standardization. By this it is not meant that concrete chapters can be printed and inserted bodily in the individual specification with merely a glance at the heading, as can be done with the specifications of certain patented articles, nor is it possible to make much headway with a specification for all kinds of concrete work for all parts of the country. But a standard specification can be written for a certain class of building work in a given locality which will, by suitable deletions and such minor descriptive items as pertain specifically to the individual job, answer for the greater part of the work of any one office, and also be a helpful guide in the exceptional cases. Such a specification should contain many sidenotes suggestive of conditions under which certain omissions or additions should be made and should suggest necessary cross references to "Allowances" and other chapters. This standard can be used in two ways: first, by having a single copy and using it as a guide for dictating and, second, by having the standard mimeographed and marking one sheet up as needed for stenographic copy.

Here is a satisfactory outline of such a chapter for ordinary building work:

A. Extent of Work and Estimates
   1. Extent of work.
   2. Division of estimate.
   3. Alternate estimates.
   4. Unit prices.

ROE & DOE
ARCHITECTS & ENGINEERS
BOSTON, MASS.

BEAM AND SLAB
COMPUTATION SHEET

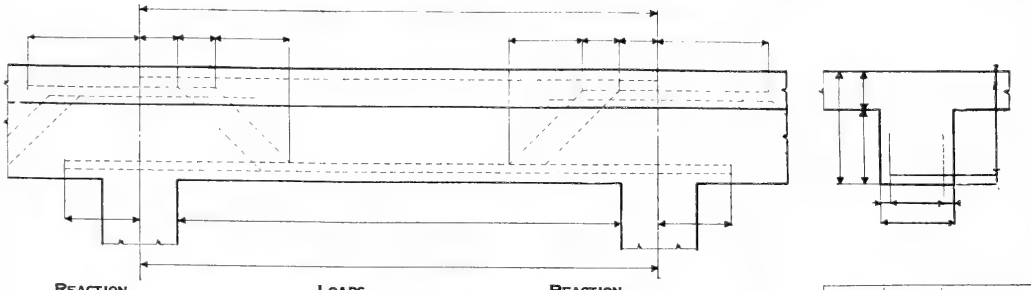
JOB No.
SHEET No.

COMPUTED BY DATE CHECKED BY DATE

REMARKS

COMPUTATION FOR

ALLOWABLE fc = fs = n = v = u =



REACTION LOADS REACTION

	LOAD Per Sq. Ft.	WIDTH of Panel	
LIVE LOAD			=
SLAB			=
FINISH & PLAS.			=
WT. OF BEAM			=
			=

TOTAL LOAD PER FT. =

Fig. 1

ROE & DOE
ARCHITECTS & ENGINEERS
BOSTON, MASS.

COLUMN
COMPUTATION SHEET Job

Computed by Checked by Date Sheet No.

Remarks

FLOORS	STORY HEIGHT		LOADS	DESIGN		LOADS	DESIGN
	TYP. COL.						
	SIM. COL.						
	TOTAL						
	L. LOAD						
	ROOF						
	BEAMS						
	WALLS						
	COL.						
	TOTAL						
	L. LOAD						
	FLOOR						
	BEAMS						
	WALLS						
	COL.						
	TOTAL						
	L. LOAD						
	FLOOR						

Fig. 2

B. Materials
1. Cement.
2. Sand.
3. Coarse aggregate.
4. Cinders.
5. Water.
6. Reinforcement.
7. Waterproofing materials.
8. Hydrated lime.

C. Workmanship
1. Forms.
2. Bending and placing reinforcement.
3. Proportioning concrete.
4. Mixing concrete.
5. Placing concrete.
6. Construction joints.
7. Cold weather protection.

D. Details of Construction
1. Granolithic floor finish.
2. Cinder concrete.
3. Roof crickets.
4. Holes for pipes, etc.
5. Rubble concrete.
6. Surface treatment.
7. Special details.

In division "A" the section on extent of work is of course different for each case. Sometimes, when the work is largely concrete, the general description at the beginning of the specification covers this point sufficiently. Sections 2, 3 and 4 of this division are governed by the customs of the individual office in letting work as well as by the conditions of the specific instance. They can be arranged in any case so that it will be necessary only to fill in a few words under each item if they are needed.

In division "B,"—"Materials,"—"Cement," "Lime" and "Reinforcement" can be covered as regards quality by reference to the standard specifications of the American Society for Testing Materials. It must be noted under reinforcement, however, that there are several possible alternatives. All should be covered in the standard, and those not needed deleted from the individual specification. The quality of sand, coarse aggregates, cinders and water can be covered by standard paragraphs for any given section of the country. The sizes of the coarse aggregates can be left to "Proportioning Concrete" in division C. Occasionally special paragraphs will be needed on aggregates required for ornamental surface treatment. In the standard specification this can be taken care of by suitable sidenotes. Waterproofing materials can be covered by standard paragraphs for the great majority of cases, since the accepted types of waterproofing materials are few in number.

Under division C,—"Workmanship,"—"Forms," "Bending and Placing Reinforcement," "Mixing Concrete," "Placing Concrete," and "Construction Joints" can all be covered by standard paragraphs and adapted to the individual piece of work by suitable deletions. The section on proportioning concrete can be similarly handled by the use of a table of mixtures from which such are used and referred to as needed in the individual case. The section on "Cold Weather Protection" will be used or omitted as a whole. For the benefit of the entire building industry it is to be hoped that there will be increasing need for its use. The Portland Cement Association publishes a pamphlet which gives excellent material for this section.

In division D, brief standard sections will cover "Cinder Concrete," "Roof Crickets," "Holes for Pipes, etc.," and "Rubble Concrete." "Granolithic Finish" has several possibilities from which to choose, and this is the case to an even greater extent in the matter of "Surface Treatment." The writing of these sections will be greatly facilitated by reference to the "Proceedings of the American Concrete Institute" for the last year or two. The section "Special Details" is the catchall for minor special features which will occasionally crop up. With complete drawings it is not often needed.

But the arts and sciences are moving forward, and the best of standards must be frequently revised. The "Tentative Specifications for Concrete and Reinforced Concrete of the Joint Committee of Engineering Societies," issued about a year ago, suggests many changes in practice which may occur in the next few years. While it is not at present in such shape as to be of very definite help, it should be read by every writer of specifications.

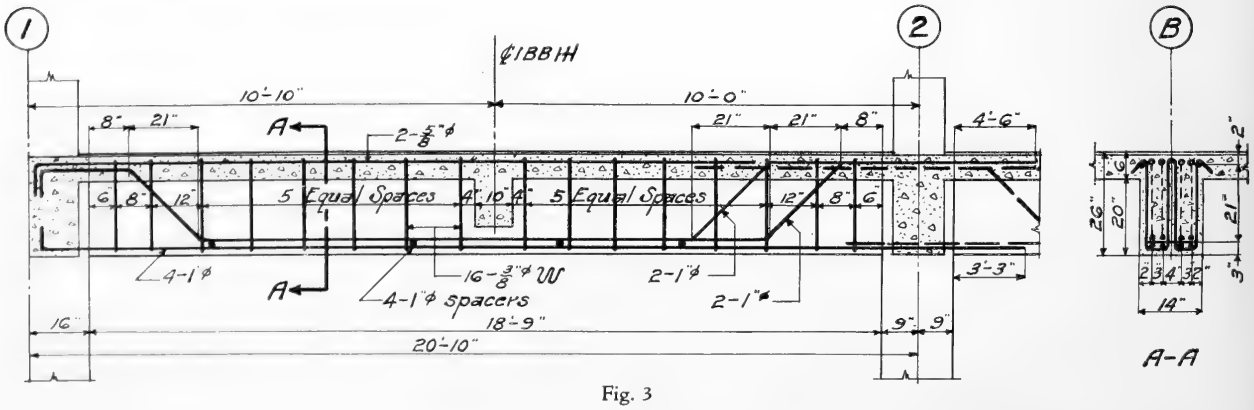


Fig. 3

Plate Description

House of Mrs. William Hayward, 1051 Fifth avenue, New York. Plates 73–80. Situated at the corner of Fifth avenue and 86th street and facing Central Park this residence is one of the most important individual dwellings erected in New York during recent years. Designed by Guy Lowell in the style of the Italian renaissance, the house is built entirely of pink Tennessee marble, while a balustrade of bronze is placed above the cornice.

The plan of the interior provides rooms of unusual size and height. From the vestibule one enters the lower hall from which the dining room opens at the right, while at the left and facing Fifth avenue are two reception rooms, and just ahead is the stair hall of elliptical form in which the balanced stairway leads to the main floor. Upon this floor the entire avenue side of the house is taken up by the drawing room which is connected by a long gallery facing 86th street with the library, while still beyond is a billiard room. The ceilings of the first floor are 15 feet and those of the second or main floor 18 feet, 6 inches in height.

The interior of the house fulfills the promise made by its rich and dignified exterior. Several of the rooms are fitted with antique paneling and other woodwork taken from old buildings in France and England, and the furnishings of the house are largely antiques, with many treasures of paintings, tapestries and oriental porcelain.

Co-operative Apartment House, 136 East 67th street, New York. Plates 81, 82. This structure is the latest of several co-operative apartment buildings in the neighborhood centering at 67th street and Lexington avenue, but it has not the height which often characterizes New York apartment houses, being but approximately one-half that of the adjoining structure shown in one of the plates. Owing to the ample area of the plot it has been possible to give all the apartments excellent light and air, for as viewed from the street the building is arranged somewhat in courtyard fashion, while at the rear which is toward the south the structure is planned with a deep court.

Walker & Gillette, the architects of the building, have planned the exterior in the Spanish style with stuccoed walls and with tiles used upon the roofs, the parapet and even upon certain of the chimneys, while balconies of wrought iron of simple patterns are placed at certain of the windows to give accent and variety to the stuccoed facade. The building gains an added Spanish character by the recessing of the upper story some distance from the roof cornice and the covering of this story with a low pitched tile roof of its own.

Longwood Cricket Club, Chestnut Hill, Mass. Plates 83–86. Judicious alterations and additions have transformed an old and obsolete building into this well planned and attractive clubhouse. The operations involved the moving of the original structure to a new site, the addition of a new wing, considerable altering of the interior and correction of many architectural shortcomings in the way of faulty lines and excess ornament.

The present building, of which Putnam & Cox are the architects, is planned with two fronts, the entrance front near which are arranged the offices and rooms for the reception of guests, and another front which overlooks the tennis courts. The arrangement of the main floor makes excellent provision for the uses of a club of somewhat broad scope and provides a lounging room of generous size and two full stories in height. At one end is a stage or platform, useful for many purposes, while at either side of a great fireplace French windows open upon a broad terrace which is placed at a considerable elevation above the grounds. At the end opposite the stage doors lead from the lounge into the club's dining room, while still beyond is an out of door dining room, both these departments being served from one kitchen and pantry.

The exterior presents an appearance wholly different from that of the original building. After the various changes were made, the shingled walls of the old structure as well as the walls of the newer portions were covered with metal lath upon which cream colored stucco of a slightly rough cast was applied. The chimneys were also stuccoed, the roofs covered with slate of varied colors, and the blinds painted dark green. The terrace upon which the lounge opens is supported by a brick wall, and about the terrace is a wood balustrade painted white to match the rest of the exterior trim.

House of Arthur S. Parks, Esq., Wichita, Kan. Plates 87, 88. In the exterior lines of this residence there is much to suggest the types associated with the early Spanish buildings in the west and southwest; the broad horizontal roof lines, emphasized by the overhanging veranda or balcony across the front, recall distinctly similar planning in old buildings in southern California, while the Spanish feeling is strengthened by the grouping of all the necessary structures under what is practically one roof, and the wooden gateway leading to the service quarters and garage. The materials used, however, are brick for the exterior walls and shingles for the roofs, materials which do not lend themselves to carrying out the Spanish type suggested by the design of the building, though presenting a pleasing appearance, particularly since the house stands surrounded by grounds which are well planned and are being well developed.

The architect, Myron Hunt, has provided a plan adapted to the spirit of the exterior—large rooms arranged in somewhat informal fashion, the large living room opening at one side upon a covered porch and at another side upon a broad terrace.

EDITORIAL COMMENT

ARCHITECTURAL EDUCATION AND THE PROFESSION

THE progress of architectural education in the United States, though extending over a comparatively brief period of time, has in general kept pace with the demands of the profession. As in the case of many other American activities we have chosen features from European precedents, adapting them to fit our special needs and conditions. Thus we were first influenced by the thorough training in the so-called practical subjects that resulted from the English system of pupilage; this produced the first architectural courses as a part of engineering study in our large technical schools. Later we were influenced by the work of the Ecole des Beaux-Arts in Paris, and with the accession of French masters and the return of many American students trained in the methods of the Ecole the pendulum swung to the opposite extreme, and a worship of the "style" sponsored by modern French architects drew attention away from construction and focused it on axes of plan and elaborate conception of elevation, which translated into brick and stone many of the Grand Prix projects that presented such beautiful studies on paper.

These two extremes afforded opportunity for study of educational methods, and we now enjoy the benefits of a system that is a compromise between them and quite typically American. That the ideal in architectural education has not been reached is, however, evident from the detailed discussion the topic always provokes at conventions of the American Institute of Architects. The problem is made complicated by the fact that architecture is both a science and an art, each phase demanding distinctly different teaching methods; the teaching of science consists of putting before the pupil facts which he is to store and later use as facts; in art, the facts are placed before the pupil, but for him to digest and reproduce in his own form. The problem is to secure a proper balance between the two, and the schools complain that the profession is not a unit in voicing its opinion as to the respective importance of these divergent requirements. The present system of education has done remarkably well under this handicap, but recent tendencies would indicate that instead of bringing the æsthetic and constructive sides of architecture together, they are being developed separately.

We have seen the manifestation of this possibility in practice within the past few years. The danger is that architecture will cease to have a definite function. We cannot deny that the engineer can construct without an architect, that the builder can build, and that the decorator can decorate without an architect. The architect's province and logical function are to direct the efforts of these various specialists, and through the medium of his general solution of a building problem produce a structure that meets definite requirements. He must have a broad understanding of the architect's real function; he must have a knowledge of modern methods and materials that will organically connect him with modern building. Disproportionate emphasis on pure design and too close study of building methods and instincts of the past will develop only academic knowledge. These problems are first met in actual practice; it is, therefore, from this experience that the requirements for successful training must be relayed to the schools. This means co-operation between the profession and the schools, and this element is too often lacking.

A definite example of one way to accomplish this co-operation is shown by the architects of Boston. Boston has always been favored in architectural education by the presence of the two schools of architecture at the Massachusetts Institute of Technology and at Harvard University. An enterprising atelier has also been conducted at the Boston Architectural Club, for the younger men working in the offices, and the atelier and the schools in past years have frequently collaborated on design problems to mutual advantage.

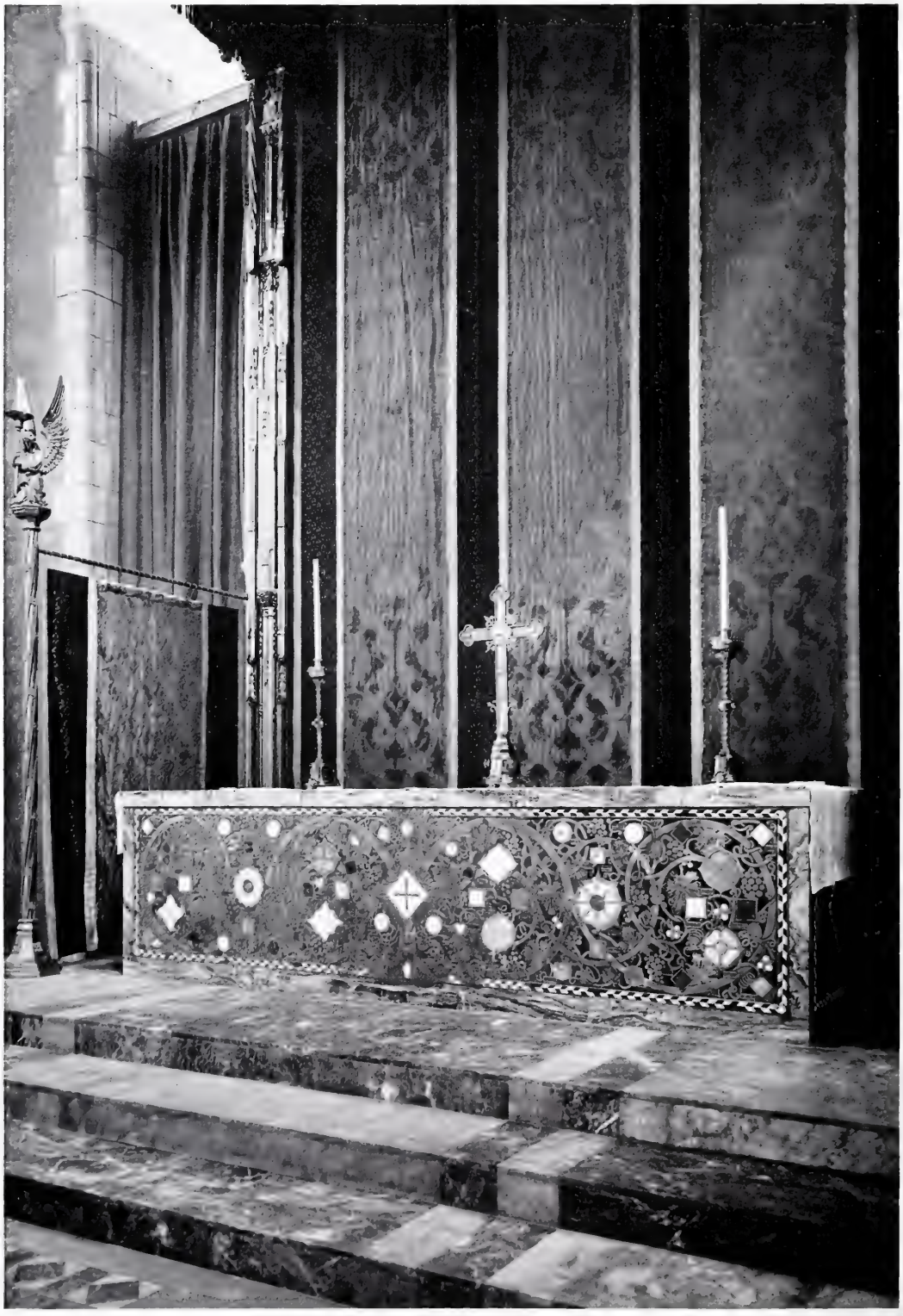
These facilities have served well for the younger student, but there has been no opportunity of giving the students the benefit of association with older men, nor has there been enough opportunity for the man past student age to profit from teaching as it is worked out in the great French schools.

The Committee of Education of the Boston Society of Architects has now arranged with the two professional schools for a revision of schedules that will permit students to continue their relations with their parent schools for the years immediately following their graduation. To encourage this movement back to the schools, the Boston Society of Architects has announced, as part of its annual competition, a prize of $150 "to go to the best project presented by a regular or special student at Harvard, Technology, or the Boston Architectural Club, or to any former student (not necessarily a graduate) who has been out of school for not more than five years. All projects must be done at one of the three schools."

Many of the Boston offices have agreed to permit their draftsmen to participate from time to time in this work, and the results are expected not only to strengthen the men who take up the opportunity, but to strengthen the schools as well.

DECORATION *and* FURNITURE

A DEPARTMENT
DEVOTED TO THE VARIED
PROFESSIONAL & DESIGN INTERESTS
WITH SPECIAL REFERENCE TO
AVAILABLE MATERIALS



AN ALTAR TREATMENT WITH AMERICAN FABRICS
EXHIBITING MASTERLY SCALE
BERTRAM GROSVENOR GOODHUE, ARCHITECT

The Architectural Forum

A Plea for the Architect's Interest in Textile Fabrics

III. FABRICS AVAILABLE IN SHOPS TODAY

By HORACE MORAN, *Interior Decorator*

THE patrician of early Greek and Eastern civilization and his counterpart down to the nineteenth century were the only secular patrons of the textile arts in the past. The religious organizations were the other important factor in their encouragement. It was this and the possession of only the hand loom which have resulted in the production of all the great forms of woven material which have yielded to us such a wealth of decorative fabric documents, the source of inspiration for these days of quantity production. Since the introduction of the power loom the producers have been well occupied in applying this inheritance to modern needs, both by reproducing the costly weaves and adapting their designs to the more common materials.

The simplicity of democracy, perhaps somewhat of a pose in matters æsthetic, has given rise to a great variety of simple textiles, not affecting the costly weaves, but made to look the modest rôle they play and adapted to the modest homes they would grace. It is worthy of note that the Greeks of the classic period boasted just such simplicity in their fabrics, particularly for garments, which were purged of the florid and resplendent design of their Eastern neighbors. This reverting to the simple with us is a natural reaction following a period of debauchery in design, during which the gorgeous and pretentious ruled, regardless of real æsthetic merit. We are now treading more cautiously the field of design, and with the encouragement of the architect and the cultured client we may forget our upholstered past and use the art of the weaver to cheer interiors and not to smother them.

In this train of thought, one is tempted to consider the trend of interior design in general, so closely are the decorative fabrics related to the subject. Just one thought in this direction. The home decorated with elements so simple that the interior effect is grasped at a glance is devoid of interest, is created without imagination, and shows the influence of the thousand and one magazine articles on "how to decorate the home"; it looks like the show-

A Splendid Use of Tapestry on Furniture, the Decorative Value of Which Is Enhanced by the Marble Walls

Charles A. Platt, Architect

room of a dealer in house furnishings, and satisfies the mind of the dweller therein only because his æsthetic sense became atrophied in youth.

The many irrational and conflicting "schools" of art of recent years have led the confiding public into such confused emotions that it is a joy to see the reaction setting in in favor of a substantial, rational art, strong in a creative sense and with the rich background of tradition. This is manifesting itself in the fabric world and meets with the approval of all sane designers. There is a marked drift toward fullness of color and design, making interiors it is a pleasure to enter, and which always increase in interest like an often-heard symphony.

A Generous Use of Printed Linen for Curtains Rich in Colors and Almost as Effective as Tapestry. Horace Moran, Decorator

But to return to our subject. We are also passing beyond the era of shop tradition, when we were the victims of the upholsterer and curtain maker—a time when the drawing room window was draped with elaborate creations of plush with great and fearful fringes and tassels. This over-garment partly exposed two layers of gorgeous lace, and such an arrangement was considered quite correct and loudly proclaimed the financial standing of its owner. The chair of that period was upholstered, plump and bulbous, and boasted fringes like the mane of an Assyrian lion; he was indeed fleshy who could sink the springs to any degree of comfort. The walls, not hung, but covered with silk drawn taut over a padded lining, completed the picture. This in England, the mid-Victorian, was with us the "Grant" period. Today the designer instructs the mechanic how to arrange the curtains, selects not only the fabrics, but the fringes, the linings, and hardware, and finds all this as important for his composition as the details he gives to the cabinet maker.

A Window Treatment Showing the Value of Scale in the Curtains
John Russell Pope, Architect

There is a much-used piece of furniture of today for which there is no precedent in the past. This is the "all-upholstered" chair or sofa. Designers have for the past 30 or 40 years tried to add to this details of exposed wood frame in an effort to give it the character of some particular period of design. The shops are full of such creations, and they are sure to be found in the homes of those who know nothing of design and do not seek professional advice. This all-upholstered piece of furniture is not to be condemned, for it is useful and need not be made to assert itself in an interior. The solution of the problem is the omission of all elaborations of outline in the upholstery, the suppressing of all exposed woodwork, and adding to what is a piece of furniture of great comfort a covering material not aggressive. The writer recalls the salon of a duquesa at Madrid filled with gems of the

A Playful Use of Fabrics in a Room with Plain Walls
Cross & Cross, Architects

early Spanish crafts, one of the most interesting interiors in Europe, but with just such upholstered furniture for the comfort of her guests.

There are some things we overlook in the mad rush to execute work, but those who would employ textile fabrics effectively should never forget, first, that a wall hung with a fabric is usually more impressive than a wall upholstered; second, that a window should be hung with real curtains, not cluttered with meaningless drapery; third, that doorways between rooms are seldom improved by adding curtains, and fourth, that a chair seat looks and is more comfortable if concave and not convex, and that a loose cushion, the earliest form of upholstery, is always decorative and inviting.

To conclude, it would seem to be appropriate to give the reader a list of all the available fabrics to be had in shops of the dealers. This, however, would be beyond the range of a magazine article, and the list here given is made up of a few items from stocks that can be found at any important dealer's show rooms, showing how extensive is this field. The names designating the fabrics in each instance create as distinct an image in the mind of designers accustomed to using fabrics as would a list of the members of a classic entablature to the architect. For curtains or upholstery there are such materials as Atsbury Velvet, Antique Mohair, Belgravia Velvet, Bradford Reps, Cordova Velvets, Jaspe Cloths, Radnor Cloths, Satin Directoire, and so on. Of materials that may only be used for curtains, there are Burma Cloths, Ming Toy Silks, Tanjore Gauze, Watteau Reps, and Sunfast Super-Kopocks.

The professional world can hardly be expected to appreciate the development of textile manufacture in this country. We are now producing every kind of decorative fabric, and can boast excellent velvets, damasks and tapestries, as well as the many varieties of less costly materials. One of our difficulties in the past was the making of enduring dyes of subtle colors, but the demand for this essential quality in fabrics is meeting with a willing response on the part of the producers. We must encourage the American mills with our patronage, and freely admire and boldly condemn where merit and failure warrant it.

The illustrations of interiors accompanying this article reveal an effort not to burden the composition with an excess of fabrics, but rather a natural placing of such materials where they will be of use and gracefully lend their decorative value to the interior.

A Room with All the Fabrics Plain, the Walls Giving Sufficient Play of Detail
John Russell Pope, Architect

A Rational Window Treatment with Curtain Poles in Pockets
CROSS & CROSS, ARCHITECTS

This Room of Marble Would Have Been Less Impressive with Other Than a Simple Treatment at the Windows
CHARLES A. PLATT, ARCHITECT

Some Furniture by Duncan Phyfe

EXHIBITION AT METROPOLITAN MUSEUM

INTEREST in early American furniture, already greatly encouraged and strengthened by study of the permanent collections of the Metropolitan Museum of Art, is being further stimulated by an exhibition, from October 16 to December 15, of a group of more than 100 examples of furniture from the workshop of Duncan Phyfe, the New York cabinet maker. The pieces exhibited have been loaned by different friends of the museum from their private collections, and although they show a broad range of design they have been limited to what are considered the best years of Phyfe's period, before 1825.

Armchair by Duncan Phyfe
Showing Sheraton Influence

Unlike all the other earlier makers of American furniture, Phyfe stands out clearly, and enough remains of his authenticated work to make possible the assigning to him of a definite place among American craftsmen. A Scotchman by birth, Phyfe came to this country about 1783 and settled in New York soon after 1790. Even the most casual study of his work will show that Phyfe worked in the style prevalent in England during the latter part of the eighteenth century. At first his design was almost purely Hepplewhite or Sheraton, but early in the nineteenth century the influence of France, which was powerful in New York at that day, brought him into contact with certain elements of directoire, consulate and early empire origin. These French influences he absorbed, and combined French forms gracefully with the English types in which he had theretofore worked.

The pieces assembled at the Metropolitan fall readily into certain well defined groups. Phyfe's furniture consisted largely of chairs, sofas, and particularly of tables. He is not known as a designer of what is sometimes called "case furniture," such as sideboards, chests of drawers and other pieces made up chiefly of drawers, but a few pieces such as dressing tables, sewing tables and sideboards are in existence. Among the side chairs which are shown in this loan exhibition many are designed in a manner which plainly shows Sheraton influence, having horseshoe seats, reeded diagonal or curved cross-bars in the backs, and reeded seat-rails and legs. Another type, slightly different, retains the back and seat of the type just described, but the front legs are reversed curves, their outer surfaces adorned with acanthus leaves. The most typical of Phyfe chairs, the type with which his name is perhaps chiefly associated, exhibit full and unmistakable directoire influence with a lyre back and with legs carved in either dog foot or acanthus pattern, and still another type employs legs similarly ornamented but includes a slat in the back, made up of an oval medallion set between carved scrolls. Chairs of these varieties are found with arms, although they are rare.

As has already been suggested, Duncan Phyfe's

Dressing Table by Duncan Phyfe

Small Table with Reeded Legs

fame rests very largely upon the designs of his tables, and they may be divided into three groups according to structure: tables supported upon legs at the corners; those supported at the ends upon coupled colonnettes or else upon lyres, and those resting upon pedestals. The type first mentioned stands upon reeded legs which are straight or, as in one rare and possibly unique example, upon legs made up of reverse curves, carved with the dog foot or acanthus, these supports being quite similar to those which he often used for his chairs. Of the type which employs a pedestal there are three well defined varieties. One is that designed with a small platform which is supported upon four gracefully curved legs which are often reeded, generally terminating in a metal end or sometimes in a carved foot; this platform in turn supports crossed lyres which form a kind of pedestal upon which rests the table top. Another type, quite similar, retains the platform and curving legs, but instead of crossed lyres has four colonnettes which support the table top. The third type, used for large as well as for small tables, has the top supported upon a pedestal which often assumes the shape of an urn, from which legs carved in various spirited designs—three or more frequently four — curve outward.

Small Table with Lyre Pedestal
From Workshop of Duncan Phyfe

The French influence which lent so much of charm to Phyfe's work during what has been described as his golden period led finally to the marring of the beauty and delicacy which marked the purity of his style, for the American following of French taste extended even to acceptance of the styles of the empire when its solid, heavy forms came into vogue. Perhaps, like Chippendale and many another furniture maker before and since, Phyfe was forced against his better judgment to cater to the prevailing taste, and to design furniture in what he knew to be a debased style. His following of empire fashions was much simplified, it is true, and his ornament was handled in a somewhat restrained manner with only moderate use of decoration of gilt bronze. His furniture of this period appears to strive in a pathetic way to adhere to what might be called the letter of the empire style, while doing violence to its spirit by lightening and refining its heaviness and vulgarity—an effort, perhaps, upon the part of the student and follower of good taste to steer a middle course through the perils of a dangerous period. The effort may have proved to be too great, or possibly he was unable to check the tendency toward even more vicious design, for with the coming of black walnut and all that the name implies, Phyfe entered with the public of his day upon the downward path of bad taste, from which there was no return. Phyfe is known, happily, by only what he produced during his best period.

Typical Phyfe Work Table and Side Chairs Showing Slats with Medallions and Scrolls

A Little Writing Room at the Hampton Shops

ONE of the most delightful phases of the decoration of Louis XV days is shown in this little personal library, photographed at the Hampton Exhibits. The paneling of carved French oak and the draperies of interesting old Chinoiserie patterned French brocade are unusual, while each piece of furniture is an example of exquisite carving or marqueterie which has been chosen and arranged with that consideration of balance and scale as well as convenience of use which characterizes each Hampton interior.

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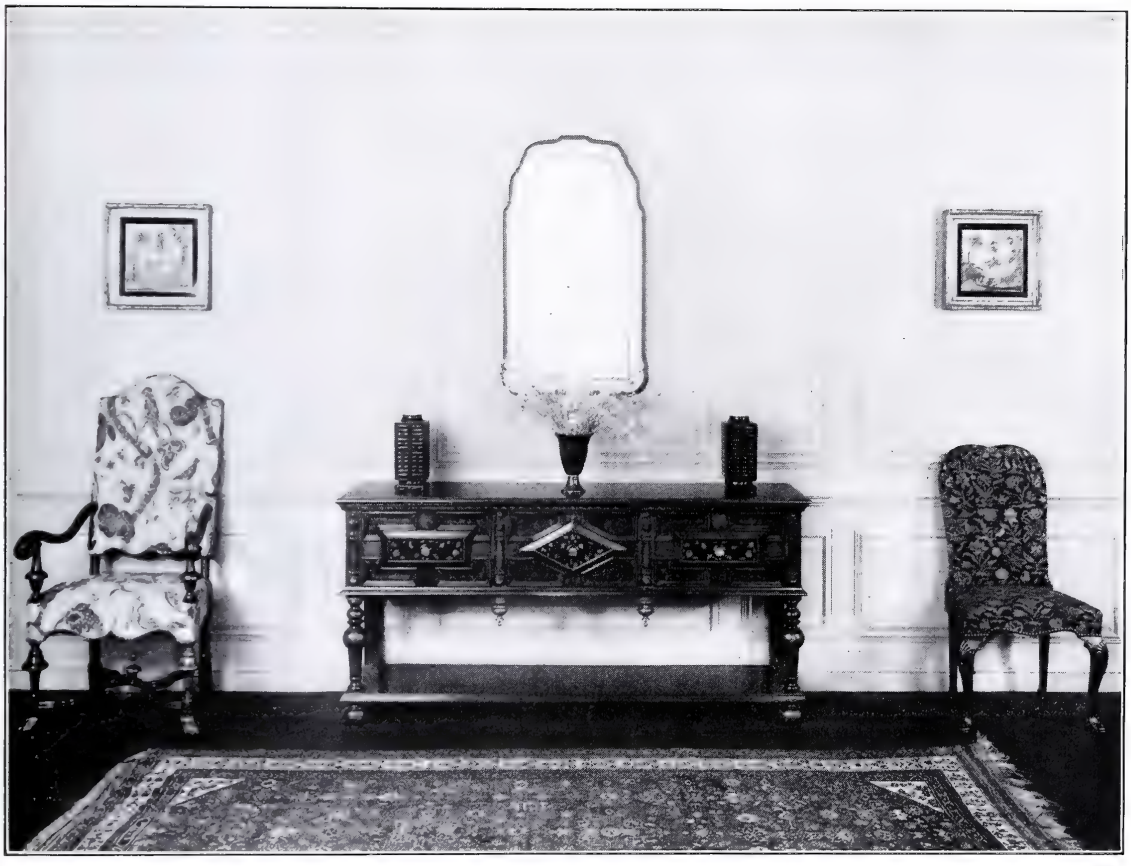
KENSINGTON FURNITURE



A Wall in the Showrooms

English walnut furniture, by Kensington
Circa 1680–1715

STRANGELY enough there was little of the classic in the Dutch influence which dominated furniture design during the fifty years, from 1668 to 1718, when under the leadership of Sir Christopher Wren the Palladian tradition was firmly established in England. Yet a common appreciation of good proportions and the value of simplicity in the treatment of flat surfaces brought the furniture into harmony with its architectural background.

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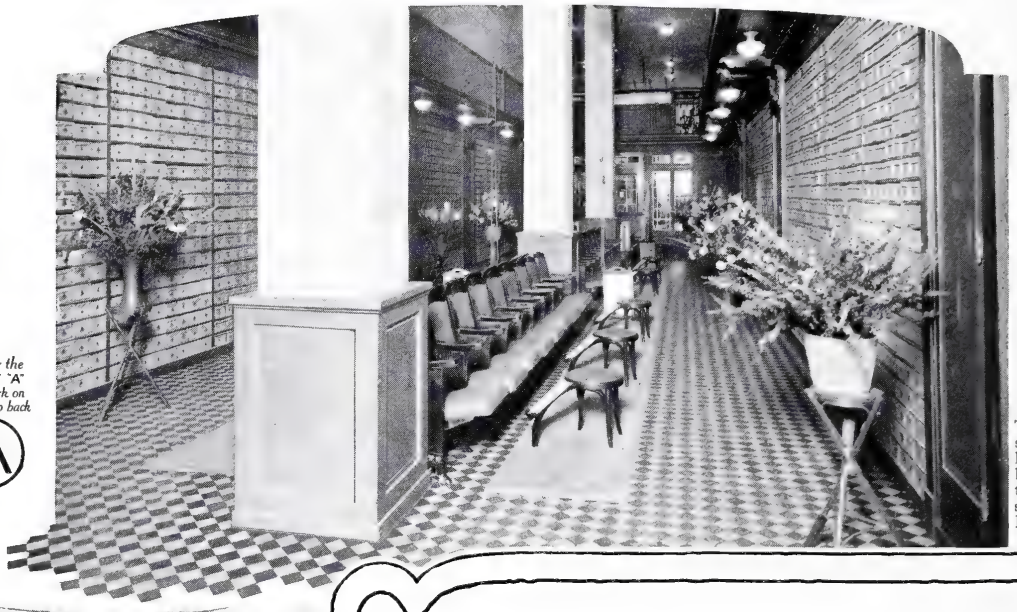

The floor of this handsome new store in Portland, Ore., is a three-inch black and gray tile pattern (No. 201) in Armstrong's Straight Line Inlaid Linoleum.

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INDO-CHINESE SCENES

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In this room in Lady Sackville's London house, hangs one of the original Soho tapestries which Schumacher has reproduced so successfully. This particular one is the original of the reproduction illustrated above.

The original Soho tapestry of which the one illustrated here is a reproduction is one of a group of eight panels probably executed in the early eighteenth century by the famous Flemish artist, John Vanderbank.

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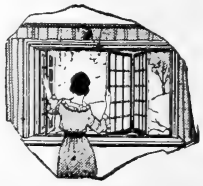

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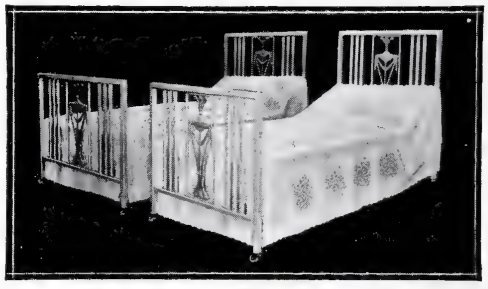

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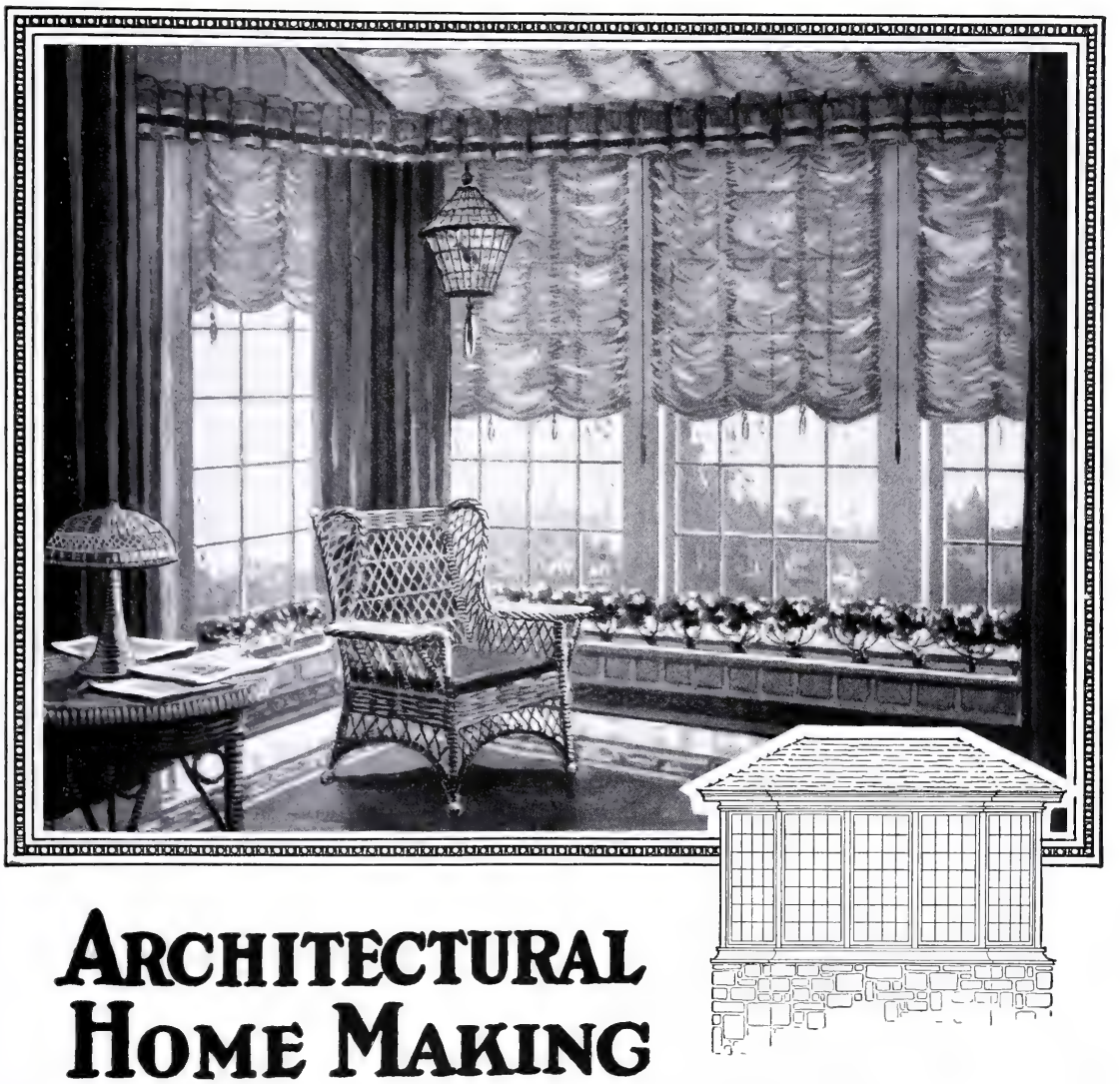

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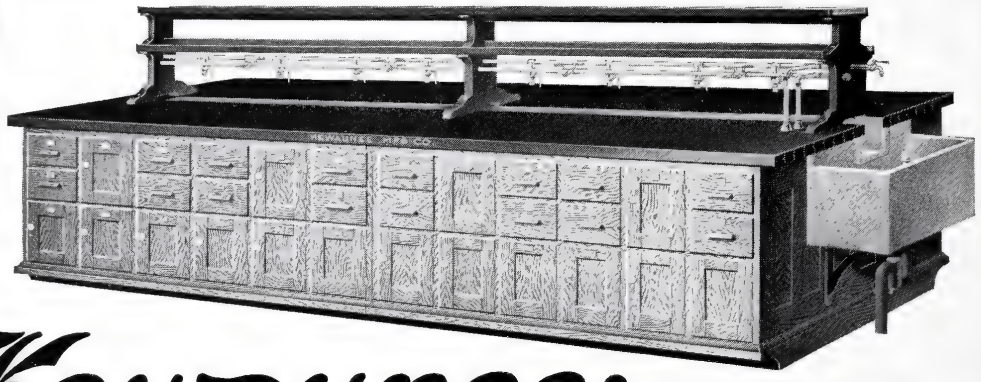

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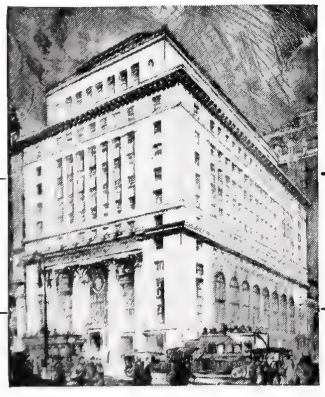

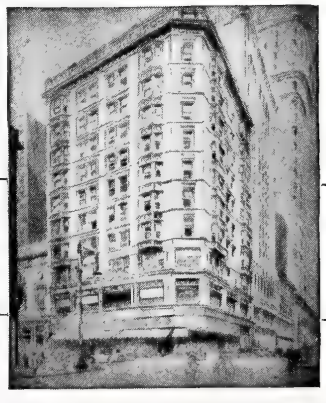

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SERVICE SECTION
of THE ARCHITECTURAL FORUM

Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

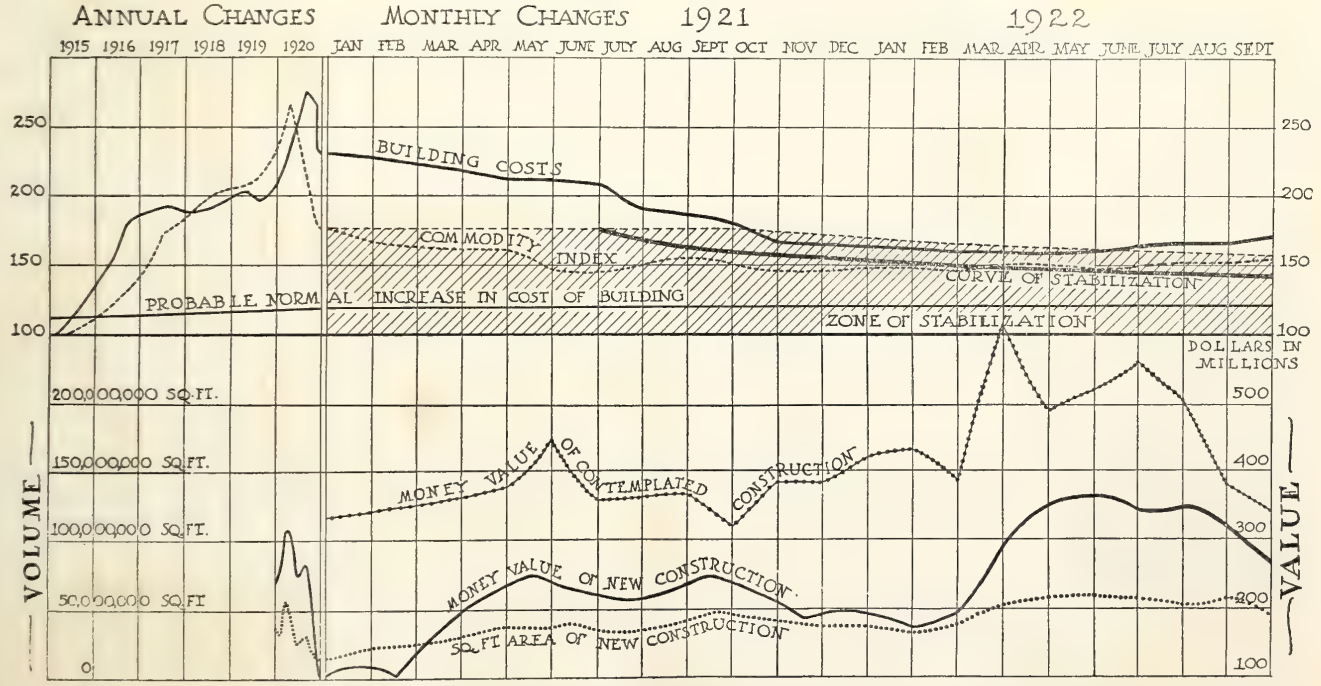
The Building Situation

THE past few weeks have recorded only a slight decrease in the volume of construction, indicating that the drop recorded in August and September has been seasonal rather than primarily due to increased costs.

Residential construction is holding up well in volume, particularly in the small house field. An analysis of the rental situation as it affects apartment buildings shows that not for many years have there been so many vacant apartments on October 1 in our larger cities. Rentals are being maintained at high levels, however, principally to justify sales prices on buildings that have passed through speculative hands. The general trend of the housing situation indicates less activity in apartment building but more interest in fine residences for next year. The building of moderate cost houses will undoubtedly be resumed actively early next year.

Engineering contractors report unusual activity in power projects and electric service buildings. Architects are very busy in the middle west and many are active in the east, although general business activity for the architect has been somewhat slower to arrive in that section. The type of work under planning for next year is excellent.

There has been a sharp increase in the cost of building, probably greater than 10 per cent in the last few weeks. Active projects are now feeling this increase, and it is definitely evident as jobs are re-estimated. It is confidently anticipated that this is only a temporary condition, however, due to the coal and labor difficulties and the readiness of some material dealers and possibly some manufacturers to take advantage of logical excuses for price raising in the midst of heavy demand. In all probability the cost of building will resume a gradual downward trend by next spring, when production facilities will be greater than ever before.

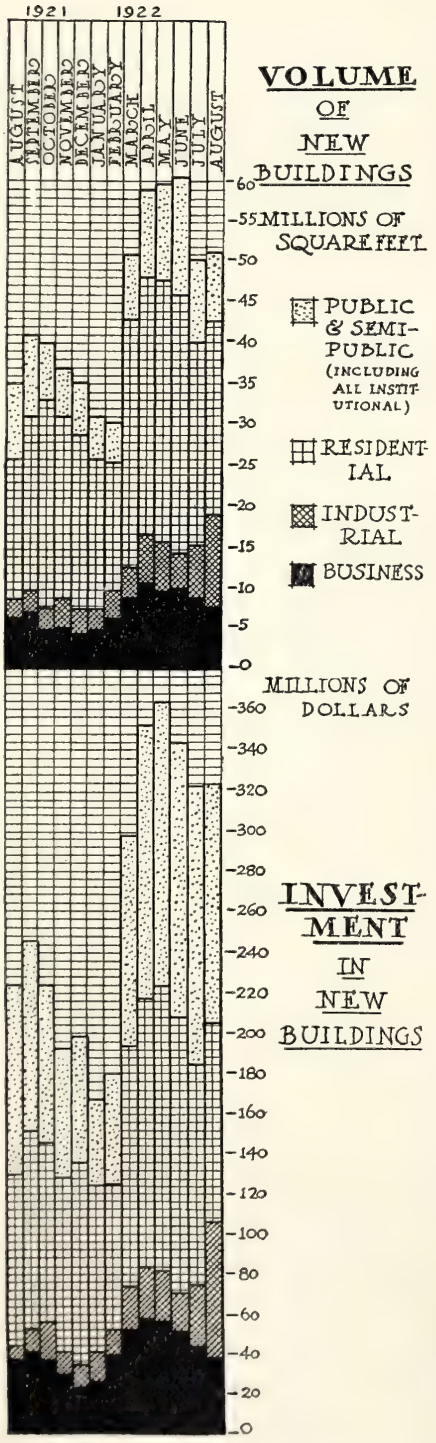


THIS chart is presented monthly with trend lines extended to the most recent date of available information. Its purpose is to show actual changes in the cost of building construction and the effect upon new building volume and investment as the *index line of building cost* approaches or recedes from the "curve of stabilization."

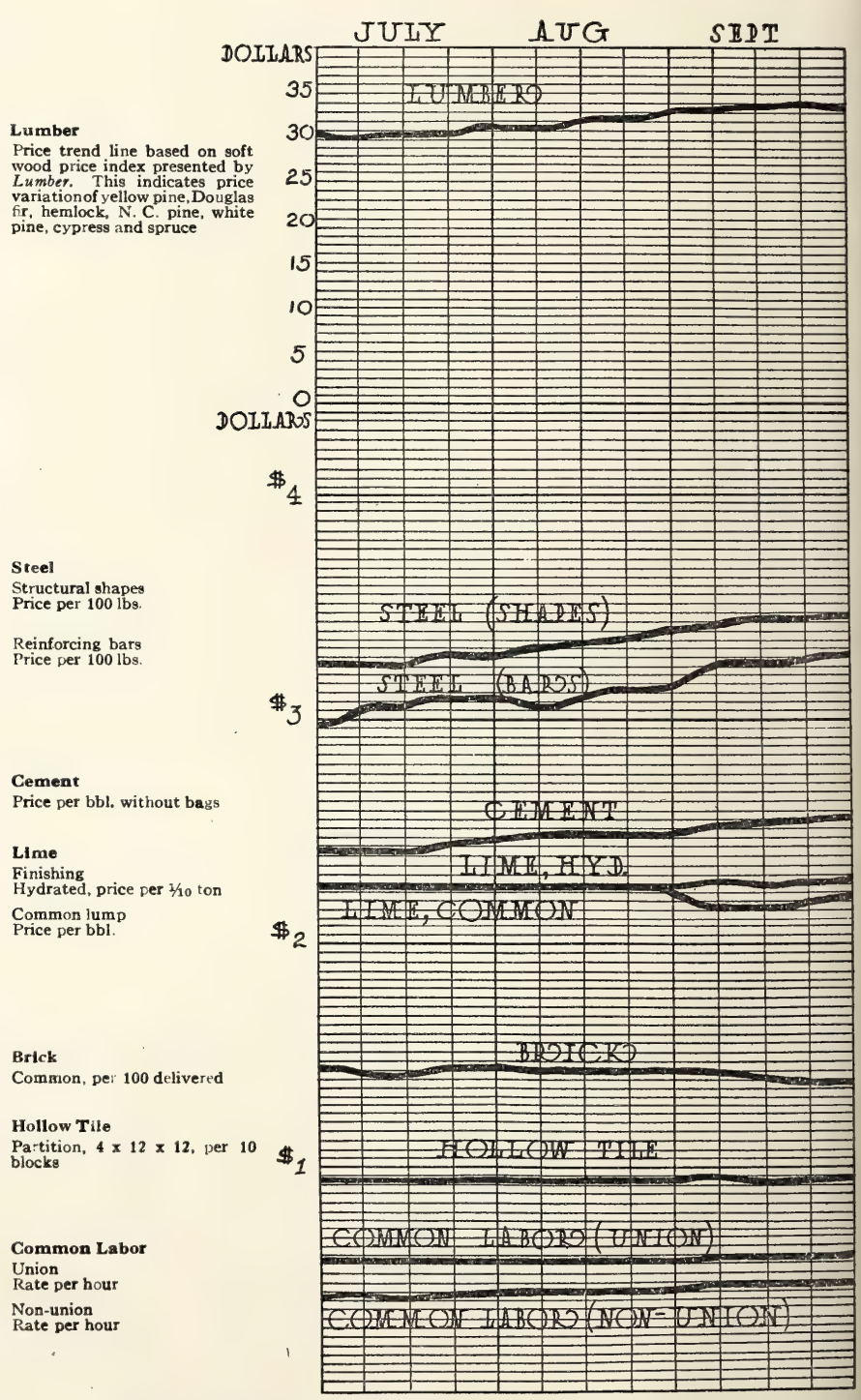
The CURVE OF STABILIZATION represents the building cost line at which investors in this field may be expected to build without fear of too great shrinkage in the reproduction value or income value of new buildings. The index line representing actual cost of building entered the ZONE OF STABILIZATION in the fall of 1921. If this cost line passes *out* of the zone of stabilization, building volume will decrease materially.

The degree of the curve of stabilization is based on (a) an analysis of time involved in return to normal conditions after the civil war and that of 1812: (b) the effect of economic control exercised by the Federal Reserve Bank in accelerating this return after the recent war, and (c) an estimate of the probable normal increase in building cost.

Factors of Fluctuation in Building Costs



Analysis of new construction showing comparative importance of major building types in volume and investment.



Figures used in developing all trend lines represent average prices to contractors in following cities: New York, Chicago, Denver, Seattle, Minneapolis, Atlanta, Dallas and San Francisco

THE graphic chart at the right is presented for the purpose of showing fluctuations in the prices of a number of important building materials and in labor costs. These fluctuations cover a period of three months and are shown in each issue of the Service Section in order to make possible at least a partial analysis of the building cost trend line as shown on the preceding page.

While the volume and investment chart shows a continuation of the seasonal decline and the effect of rising costs, it is interesting to realize that each month from July to September has shown a greater volume of construction than any similar month for many years past.

The trend of lines in the materials chart indicates basic reasons for the recent advance on building costs. As the winter season opens, practically all basic building materials and labor show a continued tendency to increase in price. It is confidently anticipated, however, that a reaction will again turn the trend of building costs into the long downward swing which must certainly represent the future of this line.

Eradication of the after-effects of the recent coal and rail disturbances will contribute definitely to this result. In view of the curtailed production of some commodities, notably lumber, because of the scarcity of cars, it is gratifying to note comparatively stable price conditions and indications that efforts are being made to prevent any "gouging" of the consumer.

BUILDING MATERIAL PRICES

Table Showing Average Prices Paid by Contractors for Building Materials at Local Distributing Points as of Sept. 1, 1922. Prepared by Division of Building and Housing of the Department of Commerce from Prices Secured through the Bureau of Census

Commodity	Size or Condition	Unit	Mass.		Conn.	New York		Penn.		Md.	Va.	W. Va.	S. C.	Ga.	Mich.				Wis.	Iowa
			Fitchburg	Haverhill	New London	Buffalo	Poughkeepsie	Pittsburgh	Erie	Baltimore	Richmond	Fairmont	Columbia	Savannah	Detroit	Pontiac	Lansing	Bay City	Milwaukee	Waterloo
Common Brick		1,000	$21.00	$25.00	.....	$20.12	$18.00	$15.00	$15.75	$20.00	$17.50	$24.00	$12.00	$14.00	$17.50	$14.40	$14.00	$13.00	$12.00	$18.90
Portland Cement	Excl. of containers	Bbl	3.20	3.55	$3.28	2.78	2.90	3.35	3.20	3.05	3.65	3.10	3.50	3.50	3.40	.....	3.75	3.15	2.40	2.60
Yellow Pine No. 1	Dimension 2x4-16′ S1S1E	M.	65.00	63.00	63.00	.....	45.00	52.00	49.00	39.00	.....	45.00	.....	25.00	55.00	43.00	48.00	39.00	38.00	45.00
Douglas Fir No. 1	Dimension 2x4-16′ S1S1E	M.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39.00	45.00
N. Carolina Pine No. 1	Dimension 2x4-16′ S1S1E	M.	.....	.....	.....	.....	.....	.....	49.00	.....	30.00	45.00	20.00	.....	.....	.....	.....	.....	.....	.....
Common Boards No. 1	1x6	M.	52.00	40.00	40.00	.....	37.00	49.00	50.00	.....	33.00	45.00	23.00	.....	75.00	48.00	45.00	37.00	.....	45.00
Y. P. Flooring E.G. "C"	1x4-10′-16′	M.	.....	100.00	80.00	.....	107.50	.....	110.00	.....	75.00	.....	75.00	.....	100.00	.....	75.00	.....	80.00	80.00
Douglas Fir V.G. No. 2	1x4-10′-16′	M.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100.00	.....	.....	.....	75.00	80.00
Red Cedar Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	6.30	7.50	.....	6.00	.....	7.25	6.50	.....	.....	.....	6.00	.....	.....	6.50	.....	6.50	.....	6.50
Cypress Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.00	.....	.....	.....	.....	.....	.....	6.50
Composition Shingles	Crushed slate surfaced	100 sq. ft.	7.50	7.75	6.50	.....	6.00	6.25	5.50	.....	.....	.....	6.25	6.50	6.50	6.00	7.50	6.00	6.50	7.5)
Gypsum Plaster Board	⅜″	1,000 sq. ft.	.....	45.00	50.00	45.(0	45.00	37.50	45.00	45.00	40.00	40.00	35.00	40.50	.....	40.00	45.00	38.00	30.00	32.00
Lime	Hyd. Com.	Ton	18.00	.....	.....	16.00	22.00	20.00	20.00	15.00	17.00	15.00	20.00	22.50	18.00	15.00	20.00	16.50	.....	25.00
Building Sand		Cu. yd.	1.80	2.20	1.50	1.28	2.00	2.50	3.00	2.00	1.40	3.75	1.00	2.20	2.50	1.50	1.80	2.00	2.00	1.75
Crushed Stone	¾″	Cu. yd.	3.00	2.50	.....	1.30	2.40	5.50	3.00	.....	2.00	6.25	2.75	5.50	2.50	.....	2.80	4.00	2.25	3.50
Window Glass	Single A 10″x12″	50 sq. ft.	5.50	.....	.....	3.90	.....	.....	.....	4.20	4.50	4.40	6.40	.....	.....	.....	.....	5.15	5.25	6.00
Hollow Tile	8″x12″x12″	Each	.27	.28	.25	.22	.24	.21	.20	.21	.....	.22	.19	.....	.21	.17	.16	.15	.13	.13
Cast Iron Soil Pipe	4″ E.H. 13 lbs. per ft.	Ton	.....	.....	.....	58.80	47.00	80.00	.....	74.00	.....	.....	.....	.....	.....	52.00	.....	51.00	.....	50.00
Steel Pipe	1″ galv.	100 ft.	.....	.....	.....	10.00	9.00	8.50	.....	9.00	7.50	11.00	9.46	.....	8.93	8.50	.....	9.75	10.50	12.00
Reinforcement Bars	¾″ square	100 lbs.	.....	.....	4.25	.....	4.50	3.00	.....	3.25	3.25	3.00	4.25	3.50	.....	.....	3.50	.....	.....	3.20
Structural Steel	Fab. 6″ I-beams	100 lbs.	5.50	6.00	.....	.....	.....	2.70	.....	.....	3.75	4.50	4.10	.....	.....	.....	3.50	3.10	.....	.....
Gypsum Plaster	Neat	Ton	.....	.....	.....	.....	20.00	22.00	24.00	22.50	22.00	16.00	20.00	.....	19.00	.....	17.50	.....	16.50	18.00
Roofing Slate	No. 1 Ribbon	100 sq. ft.	.....	.....	.....	.....	13.00	13.50	.....	.....	12.50	11.50	.....	.....	.....	17.10	.....	16.50	21.00	16.00
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	3.25	2.50	.....	2.00	2.50	1.95	2.00	.....	.....	.....	.....	1.95	1.95	2.75	3.00	2.70	.....	.....
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	1.25	1.60	.....	1.05	1.25	1.20	1.00	1.25	.95	.90	1.00	.80	.80	1.00	.....	1.00	1.00	1.50

Commodity	Size or Condition	Unit	Iowa		Mo.		Ohio					La.		Texas	Ariz.	Wash.	N. Dak.	S. Dak.		Calif.
			Des Moines	Council Bluffs	St. Louis	Kansas City	Cleveland	Akron	Dayton	Toledo	Cincinnati	New Orleans	Shreveport	San Antonio	Tucson	Spokane	Grand Forks	Sioux Falls	Aberdeen	Sacramento
Common Brick		1,000	$16.00	$16.50	$14.50	$16.50	$16.00	$14.50	$17.00	.....	$18.00	$14.00	$13.50	$17.00	$12.00	.....	$15.00	$15.00	$16.00	$17.00
Portland Cement	Excl. of containers	Bbl.	.....	.....	2.85	2.90	3.20	3.25	3.50	.....	2.76	3.10	3.50	3.10	4.40	.....	3.80	3.00	.....	3.30
Yellow Pine No. 1	Dimension 2x4-16′ S1S1E	M	44.00	43.00	46.00	46.00	.....	50.00	45.00	$49.00	44.00	45.00	44.00	45.00	.....	.....	.....	.....	.....	.....
Douglas Fir No. 1	Dimension 2x4-16′ S1S1E	M	44.00	42.50	43.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	55.00	$25.00	50.00	47.50	44.00	39.50
N. Carolina Pine No. 1	Dimension 2x4-16′ S1S1E	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Common Boards No. 1	1x6	M	42.00	41.00	49.00	51.00	49.00	50.00	.....	.....	.....	35.00	50.00	49.50	50.00	27.00	46.00	44.00	41.00	40.50
Y. P. Flooring E.G. "C"	1x4-10′-16′	M	.....	96.00	74.00	72.50	96.00	95.00	90.00	80.00	100.00	82.70	.....	.....	.....	.....	95.00	.....	.....	.....
Douglas Fir V.G. No. 2	1x4-10′-16′	M	95.00	94.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	92.50	70.00	.....	80.00	81.00	76.50
Red Cedar Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	6.00	6.00	7.18	6.50	5.76	7.00	5.20	6.40	5.40	.....	7.50	.....	.....	.....	.....	5.50	5.75	.....
Cypress Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.00	.....	6.50	.....	6.50	.....	.....	.....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	.....	8.00	6.37	5.80	6.00	.....	6.00	6.75	.....	6.71	7.50	.....	.....	.....	8.00	7.50	8.00	.....
Gypsum Plaster Board	⅜″	1,000 sq. ft.	35.50	.....	42.25	45.00	46.00	.....	32.50	42.50	.....	40.00	45.00	.....	55.00	.....	60.00	.....	.....	.....
Lime	Hyd. Com.	Ton	27.50	.....	20.00	.....	15.60	17.60	14.00	18.00	15.80	14.00	27.50	19.00	.....	.....	.....	.....	25.00	.....
Building Sand		Cu. yd.	.....	3.50	2.60	.....	2.50	1.75	1.80	.....	1.80	1.45	2.00	2.25	1.15	.....	3.00	1.50	3.25	1.50
Crushed Stone	¾″	Cu. yd.	3.00	5.00	.....	3.00	.....	3.25	2.50	.....	2.20	.....	.....	1.80	3.00	.....	.....	.....	.....	2.75
Window Glass	Single A 10″x12″	50 sq. ft.	4.50	.....	3.90	4.50	.....	4.20	4.50	.....	.....	4.20	4.50	.....	5.40	.....	4.80	.....	.....	.....
Hollow Tile	8″x12″x12″	Each	.....	.15	.....	.22	.....	.17	.18	.....	.18	.17	.25	.20	.18	.....	.....	.....	.....	.....
Cast Iron Soil Pipe	4″ E.H. 13 lbs. per ft.	Ton	.....	.....	.....	.....	.....	.....	.....	.....	.....	91.75	59.00	.....	76.00	.....	46.00	.....	.....	.....
Steel Pipe	1″ galv.	100 ft.	9.37	.....	.....	.....	.....	9.51	8.57	.....	.....	9.86	9.40	.....	11.70	11.93	8.00	.....	.....	10.85
Reinforcement Bars	¾″ square	100 lbs.	2.68	3.15	.....	2.90	.....	3.25	3.00	.....	.....	4.00	4.00	.....	4.00	4.10	3.80	4.00	.....	3.05
Structural Steel	Fab. 6″ I-beams	100 lbs.	.....	3.60	4.00	3.85	.....	3.25	3.25	.....	.....	.....	4.00	.....	.....	.....	5.90	5.00	.....	4.30
Gypsum Plaster	Neat	Ton	.....	17.50	18.50	15.50	.....	19.00	19.00	.....	.....	25.00	24.00	.....	23.00	.....	.....	15.20	20.00	.....
Roofing Slate	No. 1 Ribbon	100 sq. ft.	.....	.....	.....	.....	.....	11.00	16.5	.....	.....	16.50	12.00	.....	.....	.....	.....	.....	.....	.....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	2.63	2.80	.....	.....	2.50	.....	2.25	.....	.....	.....	2.60	.....	3.25	.....	.....	2.95	2.25	.....
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	1.08	1.25	.94	.....	.90	.....	1.15	.....	.....	.94	1.50	.....	1.75	1.13	1.50	1.30	.....	1.00

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Professor and Head of Department of Agricultural Engineering, Ohio State University. Consulting Agricultural Engineer, Columbus, Ohio.

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Address inquiries to committee members, care THE ARCHITECTURAL FORUM, 103 Park avenue, New York

THE FORUM DIGEST

A SURVEY OF IMPORTANT CURRENT ARTICLES ON BUILDING ECONOMICS AND BUSINESS CONDITIONS AFFECTING CONSTRUCTION

The Editors of this Department select from a wide range of publications matter of definite interest to Architects which would otherwise be available only through laborious effort

EFFECT OF OBSOLESCENCE ON THE USEFUL LIFE OF OFFICE BUILDINGS

AN interesting presentation of this important subject was recently made by Earle Schultz, President of the National Association of Building Owners and Managers in *Buildings and Building Management*. To determine the effect of age on the income and expenses of office buildings, reports were obtained from 155 buildings. The charts shown herewith indicate results.

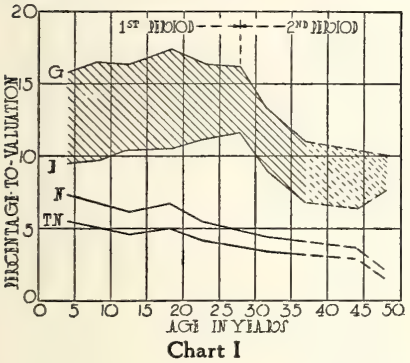


Chart I

"It will be seen from Chart I that the life of an office building may be divided into two periods.

"Period 1 extends from the erection of the building to about the 28th year. During this period the gross income is nearly constant. The expenses, however, rise continuously with a corresponding falling off in the net return. This period represents the useful and profitable life of an office building, during which it is earning an adequate return on the investment. During most of this period, the buildings are able to maintain themselves as first-class buildings housing the best grade of tenants.

"Period 2 extends from the 28th year to the end of the building's life. During this period the gross income of the building falls very rapidly as also do its operating expenses, while the net income continues to decline at a somewhat faster rate than during the first period. At the beginning of this period the building finds that through the action of obsolescence in any one or more of its several forms it is losing its better class of tenants and that it is impossible for it to maintain its income at its previous level. Because of this falling off in income, it must necessarily reduce its operating expenses in proportion by giving a cheaper grade of service, thus becoming a second grade building. In spite of all that can be done to reduce operating costs, the ever-increasing extent of repairs and replacements necessary in an old building serve to increase expenses, with the result that if the building continues in existence it soon becomes a non-producer and is very often operated at a loss.

"Period 2 necessarily ends with the life of the building, which occurs when obsolescence has progressed so far that the building is torn down to be replaced by a new structure. Later in this report many illustrations will be cited of buildings thus torn down and replaced at ages varying from 15 to 40 years. Because of the fact that when a building has arrived at the second period of its life and it is only a question of time when it will have to be torn down, its investment value declines very rapidly and is very often extinguished entirely. That is, whereas if a building is sold during the first period of its life, it will bring a price somewhere near its cost; if it is sold in the second period of its life, it will bring a very much smaller price, and very often will not be considered as adding any value whatever to the land on which it stands. As a consequence, while a building in the second period of its life may for a time under favorable conditions continue to be operated at a small margin of profit, obsolescence will have largely or wholly destroyed its sale value.

"The solid line represents the actual five-year averages, and the dotted line a theoretical curve drawn through these averages. From these curves it will be seen that during the early years of its life, the value of the average building is equal to the value of the land on which it stands. This ratio, however, increases more and more rapidly until at the age of 50 years the value of the land has become six times the value of the building. In other words, if a lot now valued at $100,000, for instance, requires as an adequate improvement a building costing $100,000 or more, then after a period of 50 years when the value of this lot has become approximately $500,000, any improvement thereon to be adequate must have a value of $500,000.

"A study of the present ratio between land and building for buildings of different ages will indicate the effect which the growth of the business district of a city has in rendering buildings inadequate improvements of the land. This has been done by taking the ratio between land and building for all the buildings reporting, and grouping them by ages to obtain five-year averages as previously explained. The averages thus obtained are indicated on Chart II. On this chart the two curves marked 'AA' represent the increasing ratio between land and building as the age of the building increases.

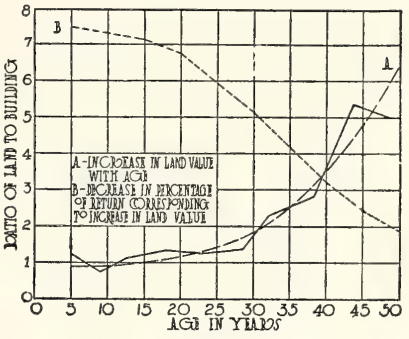


Chart II

Obsolescence in Type of Construction

"It is generally believed that the present type of office building represents the highest possible development of these structures, and consequently that they will not suffer from obsolescence in type as have the older buildings. A study of the growth of the office building and of the purpose and plan of its design will easily convince anyone that it has by no means arrived at a state of perfection.

"There has been very little office building construction throughout the country for the past six years, due to the excessive cost of labor and material, so that the supply of office space in most cities is, at the present time, inadequate. As the cost of construction gets back to normal and as business conditions improve, there will be a revival of office building construction, and out of this revival is sure to come a new type of building. If office building owners and managers have learned any one thing during the past period of inflation, it has been the necessity of economical operation. The new type of office building will, therefore, be built primarily as an investment and designed not only for efficiency of layout to produce the greatest gross income, but also for economy of operation to give the lowest operating cost. Forerunners of this type are already appearing. These newer buildings are thoroughly standardized in their layout, and their lighting, plumbing and heating arrangements are such as to permit of the moving of interior partitions without affecting any

of the mechanical equipment of the offices. In the proposed Dexter-Horton Building, to be erected next year in Seattle, this standardization has been carried to a high state of development. The cost of alterations in this building should be but a small percentage of that experienced by the average building today. This plan of standardization was also adopted in the General Motors Building in Detroit. In one regard the latter building has gone a step further. In it they are using movable steel partitions that can be taken apart and reassembled for any new layout of office space desired. In fact, quite a number of buildings in cities requiring all steel interior construction are using these movable partitions. They are as yet expensive in their first cost and are not, by any means, perfect in their design. It is only a question of time, however, until partitions of this sort will be developed that will have the greatest flexibility and will be very economical in their operation.

"One of the difficult problems of operation of the present office building is that of heat and ventilation. The office building is one of the most wasteful users of heat, because its use is entirely in the hands of the tenants who waste it without regard to cost. The new type of building will probably be mechanically ventilated throughout (as is the Chicago, Burlington and Quincy office building in Chicago) with double glass windows permanently closed. In this way the air in the office building will be at all times not only purified, but either heated or cooled to the proper temperature and moistened to the proper humidity. A building so equipped would add very materially to the efficiency and health of its occupants, and consequently would attract tenants from buildings not so equipped. Such an installation would also reduce the operating cost of heating by eliminating waste, and it would, by keeping out the dust-laden air, also eliminate much of the expense of cleaning and decorating.

"The recent Burlington fire in Chicago, in which eight floors of this very high type of fire-proof building were completely gutted by an exterior fire which came in through the windows of the building and was provided with fuel by the wooden furniture in the building, will probably lead to two new features in the coming type of building. One will be some method of protecting the windows of an office building from exterior fire exposure; the other the exclusion of all wooden furniture. It will be only through the adoption of these two provisions that an office building can afford complete fire protection to its tenants."

STANDARDIZING LUMBER AND METAL LATH

"THESE notes regarding progress of standardization in building materials appear in a recent issue of *Engineering News-Record:*

"Agreement has been reached by the central committee on lumber standards, which was appointed by the several branches of the industry last July, to formulate a program for simplification of the industry. It is planned (1) to collect and analyze all information that will aid in the simplification of sizes, grades, and names of lumber products; (2) to submit these findings to the producers, distributors, and consumers by means of the associations in these fields; (3) to promote discussion of the questions involved and to harmonize differences of opinion; (4) to establish a grade-marking and inspection service that will guarantee to the consumer the quality and quantity of his lumber purchases; and (5) to arrange a national conference of representatives of all branches of the industry which would finally adopt specific practices in these fields that will conform to the requirements of the Department of Agriculture and the Department of Commerce.

"Following the reduction in standard sizes of paving brick and lumber initiated by the Department of Commerce, work is now under way in the standardization of metal lath. A reduction from 71 to 9 in the number of weights and styles of lath was recommended at a preliminary conference held at the Department of Commerce Oct. 2. The manufacturers have worked out a plan for this reduction which they believe will be acceptable to contractors and other consumers.

"A general conference will be held Dec. 12 to which manufacturers, distributors and consumers will be invited. At that conference, it is expected that a definite conclusion will be reached."

BASIC DEFINITIONS AND CLASSIFICATIONS OF LUMBER

THE Central Committee on Lumber Standards, which met for four days during the first week of October in Washington, has assembled information on trade practices in all parts of the country, and out of its work it is hoped standards governing the production and use of lumber will come. Some of its recommendations have already been placed before the lumber industry, and perhaps of most importance are the suggested standard classifications of use, size and manufacture.

It is also suggested that there be a single standard name to identify each important commercial species, and that such standard names be exclusively used in the grading and inspection rules and in official association publications, and that their universal recognition throughout the lumber trade be promoted. A suitable outline of such species names is still to be prepared.

The definitions already agreed upon in committee are:

I. Use Classification

Lumber is the product of the saw and planing mill, not further manufactured than by sawing, resawing, and passing lengthwise through a standard planing machine, crosscut to length, and matched.

Lumber is classified as (1) yard lumber, (2) shop or factory lumber, and (3) structural timber. Different grading rules apply to each class of lumber.

(1) Yard lumber is lumber that is less than 6 inches in thickness and is intended for general building and construction purposes. The grading of yard lumber is based upon the use of the entire piece.

(2) Shop or Factory lumber is lumber intended to be cut up for use in further manufacture. It is graded on the basis of the percentage of the area which will produce a limited number of cuttings of a given minimum size and quality.

(3) Structural Timber is lumber that is 6 inches or over in thickness and width. The grading of structural timber is based upon the strength of the piece and the use of the entire piece.

Yard lumber is classified roughly as (a) Finish and (b) Construction lumber. There is no sharp line between finish and construction lumber. The medium grades may be used for either purpose.

(a) Finish is yard lumber of the higher grades in which appearance, perfection of the surface, and finishing qualities are primarily the basis on which the grade is determined. The higher finishing grades are more suitable for "natural" or transparent finishes while the lower finishing grades are smooth and free from serious defects and are particularly adapted to the use of paint.

(b) Construction lumber is yard lumber which is graded primarily upon the basis of its strength, as affected by defects, and its fitness for general construction purposes.

II. Size Classification

(1) Strips are yard lumber less than 2 inches thick and under 8 inches wide. Strips are usually manufactured into matched and patterned lumber.

(2) Boards are yard lumber less than 2 inches thick and 8 inches or over wide.

(3) Dimension includes all yard lumber excepting boards and strips and timbers; that is, yard lumber 2 inches and under 6 inches thick and of any width.

(a) Planks are yard lumber 2 inches and under 4 inches thick and 8 inches and over wide.

(b) Scantlings are yard lumber 2 inches and under 6 inches thick and under 8 inches wide.

(c) Heavy Joists are yard lumber that is 4 inches and under 6 inches thick and 8 inches or over wide.

(4) Timbers are lumber 6 inches or larger in their least dimension.

III. Manufacturing Classification

Manufactured lumber is classified as (1) Rough, (2) Surfaced, and (3) Worked.

(1) Rough lumber is undressed lumber left as it comes from the saw.

(2) Surfaced lumber is lumber that is dressed by running through a planer. It may be surfaced on one side (S1S), two sides (S2S), one edge (S1E), two edges (S2E), or a combination of sides and edges (as S1S1E, S2S1E, or S1S2E).

(3) Worked lumber is lumber which has been through a matching machine, sticker or moulder. Worked lumber may be (a) matched, (b) shiplapped or (c) patterned. Patterned lumber is usually matched or shiplapped.

(a) Matched lumber is lumber that is edge dressed and shaped to make a close tongue and groove joint at the edges or ends when laid edge to edge or end to end.

(b) Shiplapped lumber is lumber that is edge dressed to make a close rabbeted or lap joint when laid edge to edge.

(c) Patterned lumber is worked lumber that is shaped to a patterned or moulded form.

BUILDING COSTS ON PERMANENTLY HIGHER SCALE

TO all who follow the trend of building it is quite evident that building costs will remain on a higher plane than existed before the war. Graphic records of the cost increases in the elements that make up building cost are always valuable in pointing out to clients the reasons for continued high costs, and we present as of interest some charts based on those appearing in *The Constructor* for October, 1922.

In commenting on them *The Constructor* says: "It will be evident from the cost of building diagram that building costs are now 75 per cent greater than they were in 1913, and exceed the corresponding figures for any month prior to July, 1919. (The solid line in this diagram shows building costs, and the dotted line general wholesale commodity costs over the same period.)

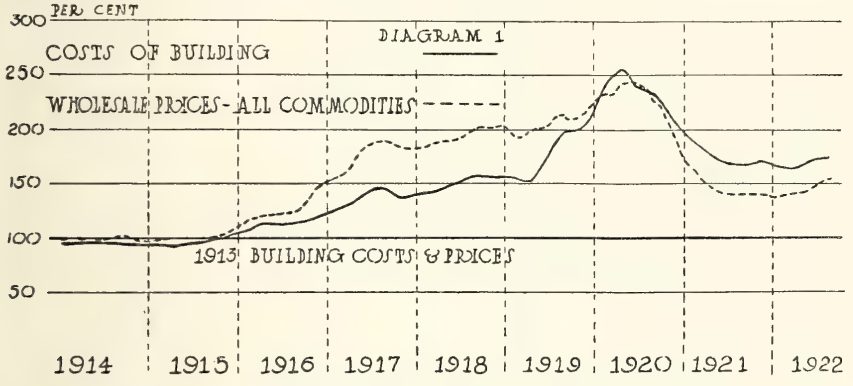


Fig. 1. Cost of Building Index and Wholesale Price Index

"Diagram 2 shows the index of building material prices computed by the Department of Labor, and is a composite of prices of some 40 different materials for which quotations are obtained from a large number of different points. Diagram 3 shows how wages in the building trades have varied in the same period and shows averages of the wages paid in 11 of the building trades in 8 representative cities. The index of the cost of building in Diagram 1 is a composite of the material index and wage index in which the former represents 60 per cent, and the latter 40 per cent of the final result. These diagrams and the index of wholesale prices of all commodities show that practically nothing can be purchased today at pre-war prices. The commodity index is a composite of the prices of over 400 different articles. It is similar in shape to that of the building cost line; average prices did not go quite so high in 1920, and they are not quite so high now as the price of building materials or the cost of completed buildings. The commodity index includes a number of important items, such as zinc, tin, copper, and rubber, which for reasons easily explained in each case are now selling at figures below pre-war prices. This helps to explain why the index of wholesale prices is at a lower point than that of building materials.

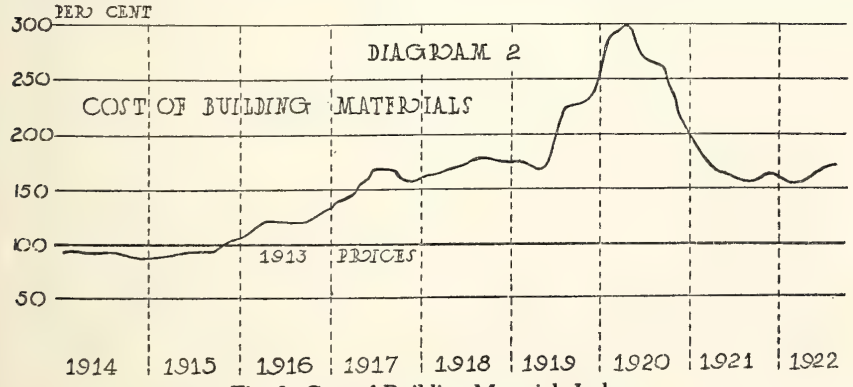


Fig. 2. Cost of Building Materials Index

"It will be noted that each of the diagrams shows an increase in prices during the past few months. This is what always happens to prices when business is recovering from a depression. It does not mean that prices are going back to where they were in 1920, and it probably does not mean that they are going very much higher than they now are, but it is a very strong argument for the contention that prices have settled down to a relatively permanent new price level. In other words, prices for some years to come will probably fluctuate in accordance with the ebb and flow of general business prosperity above and below some average point located at just about the present level."

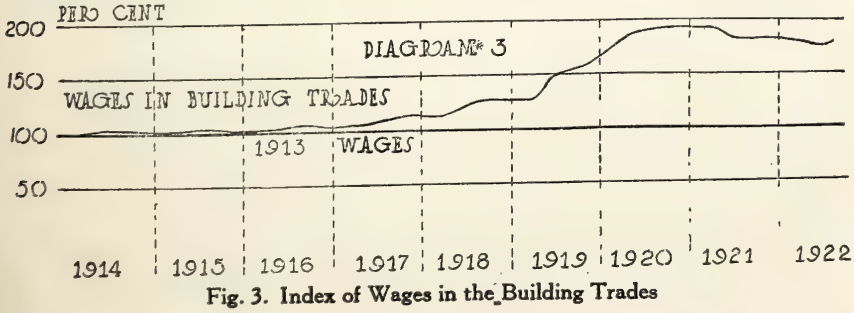


Fig. 3. Index of Wages in the Building Trades

It may well be that some time in the future, perhaps 20 years from now, the general average of prices may again be down to the 1913 figure or below it. But if we are to judge by past history, building costs will probably not go down in equal ratio. In the Civil War period just as in the World War period, the cost of building increased enormously, and this increase was due very much more to higher prices for materials than it was to higher wages. Although wages went up more slowly and relatively much less, they afterwards came down more slowly and relatively not so far as the price of materials. Following the Civil War peak and the subsequent depression there was, beginning with 1870, a period of about two and one-half years during which the price of building materials increased and also the cost of building. We seem to be now experiencing the beginning of a similar rise in prices. It is not safe, however, to figure on a close parallel between the two periods but we may conclude, that the extreme price changes of the war period are passed; that if prices in general again reach their pre-war level it will only be after many years; that wages will probably never go down to their pre-war level; and that the total cost of building, likewise, is permanently higher than it was before the war.

FACTS ABOUT BUILDING IN COLD WEATHER

ARCHITECTS will be interested in the following facts presented by C. S. Hill in a recent issue of *Engineering News-Record.* This analysis of the question of building in cold weather should encourage a decrease of seasonal activity:

"*Concrete and Building Construction*—Work on concrete structures of all kinds, and building operations generally, are commonly carried on in winter. Methods have been highly perfected and are now textbook knowledge. The conditions can be stated thus:

1. All concreting and building masonry operations can be carried on in winter with dispatch and absolute safety by heating the materials, housing in the work under construction and heating the enclosure.

2. Steel erection in winter is largely a function of storm and temperature. In any weather in which the workman can withstand the cold and work safely, structural steel can be erected.

3. Interior building work, plumbing, steamfitting, plastering, etc., can be performed in winter with little loss of efficiency.

4. Winter construction in building adds from 3 to 10 per cent to the cost according to the records of large concrete building contractors.

5. There is probably some greater risk of poor workmanship in winter concreting, masonry work and steel erection which calls for more exacting supervision and inspection.

"*General Conclusion*—Nothing in the general conditions laid down, or in the conclusions from practice, place the problem of methods of winter construction beyond the range of easy solution by engineers and contractors. With very moderate inquiry and analysis it would be practicable to state recommended practices or standard methods. This investigation may precede more complex study of economic conditions because whether or not winter construction in general is economical there are always individual operations which it will pay to carry on in winter. In other cases, such as winter hauling in road building, it may be profitable to perform parts of the work in winter. As a broad generalization of the technical problem of winter construction it may be concluded that any kind of construction can be performed for which the owner is willing to pay cold weather prices.

"*Economic Problems*—The economics of winter construction do not lend themselves to the simple methods of handling the technical problem. As applied to a single structure the economic question is: Will possession of the structure at a definite earlier date be of enough value to pay for the extra cost of winter construction and leave a little over? Visualizing the construction industry as a whole the query is much the same. While, however, in the case of the individual structure the means are at hand for a ready answer there are inadequate, indeed almost no, data by which to determine the answer for the whole industry. Determination of these data is the great task of research before engineers and contractors and the *determination needs to be quantitative.*

"Briefly, winter construction appears to offer economies by (1) spreading overhead costs over 12 producing months instead of some less period; (2) reducing the seasonal emp'oyment of men in construction and the allied industries; (3) ironing out the peak in the curve of production of construction materials and equipment; (4) equalizing the demand on transportation agencies. The economic waste in all these activities due to reduction of construction during cold weather is universally admitted as a general truth but there are no determined figures of the amount of waste. These quantitative data are what research is called upon to supply. The reasons are:

1. The construction industry is the servant of the building public and evidence of specific savings is necessary to induce the building public to alter its practices.

2. Without full knowledge of the economic waste from winter idleness in construction the industry cannot stabilize its own business or assume the duty, which it must, of teaching the public."

DATA FOR THE PLANNING OF PUBLIC GARAGES

SOME interesting information has been recently published in the monthly bulletin of the Ramp Buildings Corporation of New York. This provides definite data on general dimensions for passenger car and truck garages:

"The average automobile is 15 feet long, and in designing a garage it is advisable to allot a space of 6½ x 15 for each car. This space is not and does not include any frontage occupied by columns. Fords are 11 feet long, and a few of the largest cars are 18 feet in length. There are now several cars of approximately the size of the Ford, and among these may be listed the Chevrolet and the Star. The Cadillac is about 16 feet over all, whereas most of the cars selling for around $1,000 are 12 to 13 feet long. The average garage aisle is 20 feet wide. On this basis the minimum width of a building is about 50 feet, although buildings occasionally are made 45 feet wide and even 40 feet. A 45-foot building is feasible provided the cars to be stored are not too large, but 40 feet is never satisfactory and it is better to abandon the idea of using it.

"It is rapidly becoming common practice to make the distance between floors 10 feet in the clear, and in some cases even 9 feet has been used with satisfaction. Extreme headroom is not desirable, because it increases the cost of the building unduly and also because it increases the steepness of the ramp or the distance which the elevator must travel. In a garage building solely for passenger cars there is no reason for making the floors more than 11 feet apart, and in most cases it is quite practical to make them 10 feet.

"Where it is necessary to arrange the columns for the economical storage of both passenger cars and trucks, interchangeably, it is a good plan to use four car bays with 6½-foot spacing. In other words, the net frontage of the bay will be 26 feet which will accommodate three large trucks, four delivery cars or four passenger cars.

"Trucks vary considerably in size. Their lengths run all the way from 11 feet for a Ford to approximately 22 feet for a large truck. The Ford will have a width of a little less than 6 feet while the big truck may be more than 7 feet broad. Five-ton trucks ordinarily require a space 8 x 20 or, in rare cases, 22 or 25. There are comparatively few five-ton trucks, however, compared to two-and three-and one-ton trucks. Therefore, in designing a truck garage it is usually not necessary to have very many spaces 8 x 22. The average two-or three-ton truck will occupy a space 7½ x 18.

"In designing a truck garage it is extremely desirable to know whether the bulk of the business will consist of the storage of small trucks or large trucks. Where this point cannot be determined, or where it is feared that the character of the truck storage may change, it is advisable to use a spacing of about 7 feet for the trucks making the bays four trucks wide, or 28 feet net. Such a bay will accommodate three very large trucks without wasting too much space and, on the other hand, will accommodate four trucks of medium and small sizes. Such a bay, for example, might house one delivery car, two one-ton trucks, and one three-ton truck.

"The tallest trucks require headroom of about 11 feet, whereas there are many trucks that do not require headroom of more than 9 feet, and smaller trucks and delivery cars may not need headroom of more than 8 feet. It all depends upon the type of body. It is a good plan, therefore, in designing a truck garage to design the first floor with sufficient headroom to accommodate the largest trucks; in other words, with a headroom of 11 feet clear for the first floor, the second floor with, perhaps, 9 feet clear, and the third floor with headroom of 8 feet net. At least, this arrangement will be feasible with a three-story building to house equal numbers of small, large, and medium sized trucks."

LUMBER MARKET OUTLOOK

PRESENT conditions in the lumber market are indicated by these notes from *Lumber*, October 13, 1922:

"The lumber market appears to be more stationary than it has been for some months, and this applies to prices as well as to movement of the product. The cleaning up of a large number of transit cars of softwoods that had for a time the effect of congesting distributing centers has almost eliminated the speculative factor, with the result that both mills and wholesalers are insisting that prices are about as low as they can be expected to go despite other conditions that might contribute to either a decline or advance. It is true that price concessions are being made here and there on a few items of softwoods for which demand is light and supply abundant, but in the main prices are firm throughout the list. In fact, along the entire Atlantic seaboard there is a strengthening tendency, North Carolina pine in particular being in very active demand with prices better than they have been for quite a while. That condition does not extend to the lake region, however, where considerable 'bargaining' is reported, nor to the central west, where retail dealers are still waiting for farmers to get in a better buying mood. Conditions along the Gulf and Pacific coasts show no change of consequence. The transportation situation is still a disturbing factor, but with no prospect of immediate relief so far as the railroads are concerned the lumber industry is accepting the situation as best it can and 'carrying on' in the same way, while being consoled to some extent by increasing orders from the railroads themselves for car and other materials.

"Conditions in the hardwood branch of the industry are about the same as they have been for some weeks, which is to say that both production and shipment are suffering from inadequate transportation facilities, demand is still good and price fluctuations are still upwards."

Selected List of Manufacturers' Literature

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to *The Architectural Forum,* 142 Berkeley St., Boston, Mass., or the manufacturer direct, in which case kindly mention this publication.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

ASH HOISTS—ELECTRIC AND HAND POWER

Gillis & Geoghegan, 544 West Broadway, New York, N. Y.

General Catalog. 8½ x 11 in. 20 pp. Fully illustrated. Contains specifications in two forms (with manufacturer's name and without). Detail ¼" scale for each telescopic model and special material-handling section.

The Man-Saving Load Lifter. 5⅞ x 8⅞ in. 8 pp. Illustrated. Describes G&G Telescopic and Non-Telescopic Hoists for handling material in factories.

BOILERS—See Heating Equipment

BRICK

American Face Brick Association, 1751 Peoples Life Bldg., Chicago, Ill.

The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.

The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect. Price 50c.

Bungalow and Small House Plans. Booklets. 8½ x 11 in. 50 pp. Illustrated. Four booklets, showing a variety of designs for small face-brick houses, covering 3, 4, 5, 6, 7 and 8 room houses. Price, 25c. each, $1 for the set.

A Manual of Face-Brick Construction. Booklet. 8½ x 11 in. Text-book on construction of the brick wall and various uses of face brick. 31 colored plates of brick houses with plans. Price, $1.00.

Architectural Details in Brickwork. Series 1, 2, 3. 8½ x 11 in. Very useful to the architect or draftsman. Sent free to architects applying on their office stationery. To others, $1.50.

BUILDING FINANCE

S. W. Straus & Co., 565 Fifth Ave., New York, N. Y.

The Straus Plan of Financing. Booklet. 8 x 6 in. 24 pp. Illustrated. Describes Straus system of co-operation with Architects, Builders, Engineers and Brokers in financing important building operations; also the making of construction loans on the larger and better properties in our large cities.

Forty Years Without Loss to Any Investor. Booklet. 8 x 5 in. 38 pp. Illustrated. A carefully prepared booklet for the thinking investor. Describes Straus bonds, the property upon which loans are made, and explains the Straus plan of safeguards which made possible the 40-year record.

BUILDING STONE—See Stone, Building

CEMENT

Atlas Portland Cement Company, 25 Broadway, New York, N. Y.

The Stucco House. Booklet. 8½ x 11 in. 96 pp. Illustrated. Contains valuable data on application of Portland Cement Stucco for those interested in building. Also photographic reproductions of beautiful and unusual stucco finishes, instructions and specifications.

Atlas Handbook on Concrete Construction. Book. 4¼ x 6½ in. 144 pp. Illustrated. Provides in convenient form practical information on concrete, plain and reinforced. Written from the practical rather than from the technical point of view. A valuable pocket text-book.

Carney's Cement Company, Mankato, Minn. Booklet. 8 x 10 in. 20 pp. Illustrated. Complete information on product, showing prominent buildings in which this cement has been used.

Louisville Cement Co., 315 Guthrie St., Louisville, Ky.

Brixment. Booklet. 7½ x 5 in. 16 pp. Illustrated. Brixment, what it is, what it does, how it does it and why.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.

Medusa White Portland Cement, Stainless. Booklet. 8½ x 11 in. 48 pp. Illustrated.

Medusa Waterproof White Portland Cement. Booklet 6 x 9 in. 32 pp. Illustrated.

Medusa Review. 6 x 9 in. 18 pp. Illustrated. House organ issued bi-monthly.

CONDUIT

National Metal Molding Co., 1113 Fulton Building, Pittsburgh, Pa.

Bulletin of all National Metal Molding Products. In correspondence folder. 9½ x 11½ in.

Sherarduct. Circular. 5 x 8 in. Illustrated.

Flexsteel. Circular. 5 x 8 in. Illustrated.

CONSTRUCTION, FIREPROOF

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.

Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fire proof floor construction.

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.

Fireproof Construction. Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.

Fire-proof Construction. Handbook. 6 x 9 in. 72 pp. Illustrated. Describing Kno-Burn expanded metal lath.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.

Pyrobar Gypsum Tile. Booklet. 8½ x 11 in. 32 pp. Illustrated. Details and specifications for fireproof partitions.

Bulletins, 8½ x 11 in., containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

DAMPPROOFING

The Truscon Laboratories, Detroit, Mich.

Booklet. 5⅛ x 7¾ in. Illustrated. Contains descriptions and specifications of black dampproofing compounds for interior and exterior use.

DOORS, WINDOWS AND TRIM, METAL

Dahlstrom Metallic Door Company, 425 Buffalo Street, Jamestown, N. Y.

Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing our regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated.

Architectural Portfolio. 14 x 18 in. 30 pp. Illustrated. Portfolio of various designs and types of Dahlstrom doors. Drawings and details of each style or type. This is only sent free to reliable architects.

The Compound & Pyrono Door Company, St. Joseph, Mich.

Pyrono Handbook for Architects and Contractors. 8½ x 11 in. 16 pp. Contains full information regarding Pyrono Fireproof Veneered Doors and Trim, with complete details and specifications.

Pyrono details in sheet form for tracing.

The G. Drouvé Company, Bridgeport, Conn.

Daylighting the Factory. Booklet. 8½ x 11 in. 26 pp. Illustrated. Describes and illustrates the "Anti-Pluvius" puttyless skylight construction. Also contains interesting information on how to judge a skylight and the advantages of skylighting industrial plants.

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.

Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.

Sedgwick Machine Works, 151 West 15th Street, New York.

Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

ELECTRICAL EQUIPMENT

Frink, Inc., I. P., 24th Street and 10th Avenue, New York, N. Y.

Catalog 415. 8½ x 11 in. 46 pp. Photographs and scaled cross sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

General Electric Company, Schenectady, N. Y.

Wires and Cables. Booklet. 8 x 10½ in. 85 pp. Illustrated. Four bulletins in a binder, describing wires and cables in general, conductors insulated with vulcanized rubber compound, varnished cambric and paper insulated cables, splicing materials and junction boxes for cable installations, armored cables.

Electric Fans. Folder. 6 pp. 3¼ x 6 in. Illustrated. Describes 1922 line of electric fans, giving catalog numbers, voltages and frequencies.

Reliable Wiring Devices. Catalog. 3 x 4⅝ in. 206 pp. Illustrated. Pocket catalog giving prices, schedule classifications and data for socket receptacles, switches, rosettes, cutouts and fuses for miscellaneous devices.

Lighting of Public Buildings. Bulletin. 6 x 9 in. 25 pp. Illustrated. Describes lighting of galleries, banks, museums, libraries, municipal, county and state buildings.

Hart & Hegeman Mfg. Co., 342 Capitol Ave., Hartford, Conn.

A new H & H Switch. Leaflet. 3½ x 6 in. 4 pp. Illustrated. Illustrates a new H & H composition base push switch of DeLuxe quality.

Tumbler Switches. Booklet. 3½ x 6 in. 6 pp. Illustrated. Shows complete line of H & H Tumbler Switches.

H & H Elexits. Booklet. 8 x 10¼ in. Illustrated. Shows new complete line of Elexits—places for lights. May be used for Wall Receptacles or Electric Fixtures.

H & H Radio Button Push Switches. Booklet. 3½ x 6 in. Illustrated. Radio Luminous Buttons applied to Push Switches and Sockets.

Kohler Co., Kohler, Wis.

Kohler Automatic Power and Light 110 Volt D. C. Booklet. 5 x 7 in. 32 pp. Illustrated. Describes a standard voltage automatic, electric power and light plant for isolated homes.

Simplex Wire & Cable Co., 201 Devonshire Street, Boston, Mass.

Simplex Manual Catalog and reference book. 6¾ x 4¼ in. 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.

Sprague Electric Works of the General Electric Company, 527 West 34th St., New York, N. Y.

Panel Boards and Cabinets. Catalog No. 47901. 8 x 10½ in. 70 pp. Illustrated. Panel Boards and Cabinets shown in this catalog have been selected after careful study of the general requirements. All appliances listed herein meet with the requirements of the National Board of Fire Underwriters.

Panel Circuits. Bulletin No. 47941. 8 x 10½ in. 8 pp. Illustrated. In addition to circuits for panel boards illustrated, a full line of circuits for panel boards having fuses inside branch circuit switches is also listed.

Panel Boards and Cabinets. Bulletin No. 47942. 8 x 10½ in. 16 pp. Illustrated. This bulletin covers the ever increasing demand for devices that provide maximum safety to the operator.

Dead Front Panels. Pamphlet No. 727. 5¼ x 7¾ in. 8 pp. Illustrated. A "Safety First" pamphlet covering Safety Panels and Dead Front Switchboards, for use in office buildings, factories, theaters, department stores, public buildings and in all places where the switches may be operated by persons ignorant of the changes of contact with current-carrying parts.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 63*

ELECTRICAL EQUIPMENT — Continued

Varnum Door Engine Company, 949 West 16th St., Los Angeles, Calif.
Varnum Electric Door Engines. Booklet. 5 x 7¾ in. 16 pp Illustrated. Descriptive booklet containing illustrations and list of representative institutions now using Varnum Door Engines.

ELEVATORS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 500. Contains 32 pp. Giving general information on passenger elevators for high buildings.

Otis Elevator Company, 11th Ave. & 26th Street, New York, N. Y.
Otis Push Button Controlled Elevators. Booklet. 6 x 9 in. 56 pp. Illustrated. Detailed description of Otis Push Button Elevators. Their uses in residences, stores, institutions, apartment houses, business offices and banks, etc.
Otis Gravity Spiral Conveyors. Booklet. 6 x 9 in. 56 pp. Illustrated. Gravity spiral conveyors for lowering packaged merchandise, boxed, caged and bundled goods in factories, warehouses, terminal buildings, etc.
Otis Electric Traction Elevators. Booklet. 9 x 12 in. 28 pp. Illustrated. Full details and illustrations of Otis geared and gearless traction elevators for all types of buildings.
Otis Escalators. Booklet. 6 x 9 in. 36 pp. Illustrated. Description of step and cleat type single and double file escalators (moving stairways).

Sedgwick Machine Works, 151 West 15th Street, New York.
Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

FENCES

American Fence Construction Co., 130 West 34th St., New York.
Afco Factory Fences. Booklet. 9 x 12 in. 32 pp. Illustrated.
Residential Fences. Booklets. 7 x 2½ in. Illustrated. A series of booklets on residential fences consisting of photographs and brief descriptions.

Page Steel and Wire Company, Bridgeport, Conn.
Page American Ingot Iron Fence. Booklet. 4 x 6⅝ in. 76 pp. Illustrated. Complete information, with diagrams, sizes, etc., for those interested in rust-resisting iron fence made of ARMCO iron.
Page Ornamental Fence for Lawn and Garden. Booklet. 6 x 9 in. 12 pp. Illustrated. Description, with photographs and diagrams of lawn fence and gates. Complete instructions for ordering fence.

The Stewart Iron Works Company, Cincinnati, Ohio.
Book of Designs "B." 9 x 12 in. 80 pp. Illustrated. Book of designs illustrated from photographs of ornamental iron fence and entrance gates erected by us. Valuable to architects.

FIRE DOORS —See Doors, Windows and Trim, Metal

FIREPLACE EQUIPMENT

Covert Co., H. W., 137 E. 46th Street, New York, N. Y.
Hints on Fireplace Construction. Catalog. 5⅝ x 8½ in. 11 pp. Illustrated. Diagrams of construction and installation of Covert "Improved" and "Old Style" Dampers and Smoke Chambers. Also illustrations of Covert brass and wrought iron Fireplace Fittings.

FLOORING

Armstrong Cork & Insulation Co., 132 24th Street, Pittsburgh, Pa.
Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.
Armstrong's Cork Tile. Revised Edition. Booklet. 24 pp. 5 x 7 in. Illustrated in color. Contains complete specifications.

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including table of gauges and weights and specifications for installing linoleum floors.
Decorative Floors. Booklet. 11¼ x 15 in. 16 pp. Color plates.
Armstrong's Linoleum Pattern Book, 1922. Catalog. 3½ x 6 in. 168 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Book. Three books. 3½ x 5¾ in. Showing all gauges and thicknesses in the Armstrong line of linoleum and cork carpets.

Congoleum Company, Inc. (Linoleum Dept.), Philadelphia, Pa.
"Specifications for Laying Linoleum and Cork Carpet, according to the Congoleum Company's new method compiled after years of careful research."
Linoleum Service Sheet. Gives complete printed specifications as well as detail drawings showing application in specific cases such as thresholds, staircases, under radiators, etc.
Installation and Care of Battleship Linoleum. Booklet. 6 x 9 in. 24 pp. Illustrated. Instructions as to the uses of Battleship Linoleum, its laying and care.
Pocket Pattern Book. Descriptive Booklet. 3½ x 8½ in. 64 pp. Illustrated. Shows color reproductions of every grade and color of Gold Seal Battleship Linoleum, Inlaid Linoleum, Cork Carpet and also all patterns of the Gold-Seal Line.

Maple Flooring Manufacturers Assn., Stock Exchange Bldg., Chicago, Ill.
Flooring of Maple, Beech and Birch. Booklet. 9½ x 7 in. 46 pp. Illustrated. A complete manuscript on Maple, Beech and Birch Flooring, written by Forest Crissey.
Color Harmony in Floors. Booklet. 24 pp. 6⅜ x 4½ in. Illustrated. Reproductions in six colors of 12 styles of maple, beech and birch floors, with a short message on the subject.
How to Lay and Finish Maple, Beech and Birch Floors. Booklet. 6⅛ x 3⅜ in. 16 pp. Illustrated. A handbook on laying maple. beech and birch floors and on keeping them in good condition.
Grading Rules for Maple, Beech and Birch Flooring. Leaflet. 6⅛ x 3⅜ in. 8 pp. Illustrated. Contains information on grades, standard measurement, custom governing re-inspection, etc.

FLOORING — Continued

The Marbleloid Co., 461 Eighth Ave., New York, N. Y.
The Universal Flooring for Modern Buildings. Booklet. 6¾ x 9¾ in. 32 pp. Illustrated. Describes uses and contains specifications for Marbleloid flooring, base, wainscoting, etc.
Marbleloid Flooring for Hospitals. Bulletin. 8½ x 11 in. 4 pp. Illustrated. Describes the especial features of this composition floor for hospital buildings.
Marbleloid Specifications. Booklet. 8½ x 11 in. 4 pp. Illustrated.
Marbleloid Flooring for Schools. Bulletin. 8½ x 11 in. 4 pp. Illustrated. Describes special features of this composition floor for school buildings.

Muller Co., Franklyn R., Waukegan, Ill.
Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

The Nairn Linoleum Company, 179 Belgrove Drive, Kearny, N. J.
Linoleum. Booklet. 5½ x 8½ in. 68 pp. Illustrated in color. Reproductions in color of Inlaid, Printed, Plain and Battleship Linoleum; also Cork Carpets and Felt Base Floor Coverings.

Oak Flooring Advertising Bureau, 1057 Ashland Block, Chicago, Ill.
Modern Oak Floors. Booklet. 6⅛ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.
Oak Flooring, How and Where to Use it. Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

FLOOR HARDENERS

General Chemical Company, The, 25 Broad Street, New York, N. Y.
Making Concrete Wear Like Iron. Booklet. 4 pp. 8½ x 11 in. Illustrated. Describes Hard-n-tyte and its application to concrete floors.
Casehardening Concrete. Folder. 3¾ x 8½ in. 6 pp. Illustrated. Describes treatment of concrete surfaces with Hard-n-tyte so that they become literally "casehardened."
The Hard-n-tyte Specification. Booklet. 8½ x 11 in. 4 pp. Gives exact specifications for concrete floor finish.

Sonneborn Sons, Inc., L., 116 Fifth Avenue, New York.
Concrete and Lapidolith. Booklet. 5⅜ x 8⅛ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.
Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.
Lapidolith Specifications. Circular. 8½ x 10¾ in. 2 pp.

FLOOR HARDENERS (CHEMICAL)

The Truscon Laboratories, Detroit, Mich.
Agatex and Its Performances. Booklet. 8½ x 11 in. 16 pp. Describes use of Agatex Liquid Chemical for hardening cement floors.

FLOOR HARDENERS (METALLIC)

The Truscon Laboratories, Detroit, Mich.
Truscon Floor Hardener. Pamphlet. 7¾ x 5½ in. 18 pp.

FURNACES—See Heating Equipment

FURNITURE

American Seating Company, 1094 Lytton Bldg., Chicago, Ill.
"Ars Ecclesiastica." Booklet. 8½ x 11 in. 48 pp. 31 full page illustrations, showing the fine art of wood-carving for ecclesiastical purposes as portrayed by the craftsmen of the American Seating Company.
Seating, School, Theatre and Church. Catalogs, fully illustrated, with complete descriptions of equipment for buildings of these kinds.

Estey Organ Company, Brattleboro, Vt.
Pipe Organs. Complete specifications and full information furnished to the architect for pipe organ to be installed in any given residence, upon receipt of plans and other particulars.

Hampton Shops, 18 East 50th St., New York, N. Y.
Glimpses from Hampton Exhibits. Brochure. 16 pp. 5 x 7½ in. Illustrated. Shows examples of Hampton work and gives one an idea of their resources. Of interest to the client as well as to the architect.

Kensington Mfg. Company, 14 East 32nd St., New York, N. Y.
Photographs and full description of hand-made furniture in all the period styles furnished promptly in response to a specific inquiry.
Illustrated booklet indicative of the scope, character and decorative quality of Kensington furniture mailed on request.

Kewaunee Mfg. Company, Kewaunee, Wis.
Book No. 13. 6 x 9 in. 194 pp. Illustrated. Full description of Kewaunee Vocational Equipment for domestic science, demonstration dining rooms, fitting rooms, drafting rooms, manual training and shop-equipment, kindergarten and hospital equipment and dietetic tables.
Book No. 14. 6 x 9 in. 226 pp. Illustrated. Shows Laboratory furniture for chemistry, physics, biology, zoology, electrical and physiography laboratories, medical college, hospital laboratory equipment, industrial and commercial laboratory equipment. Engineering service gratis.

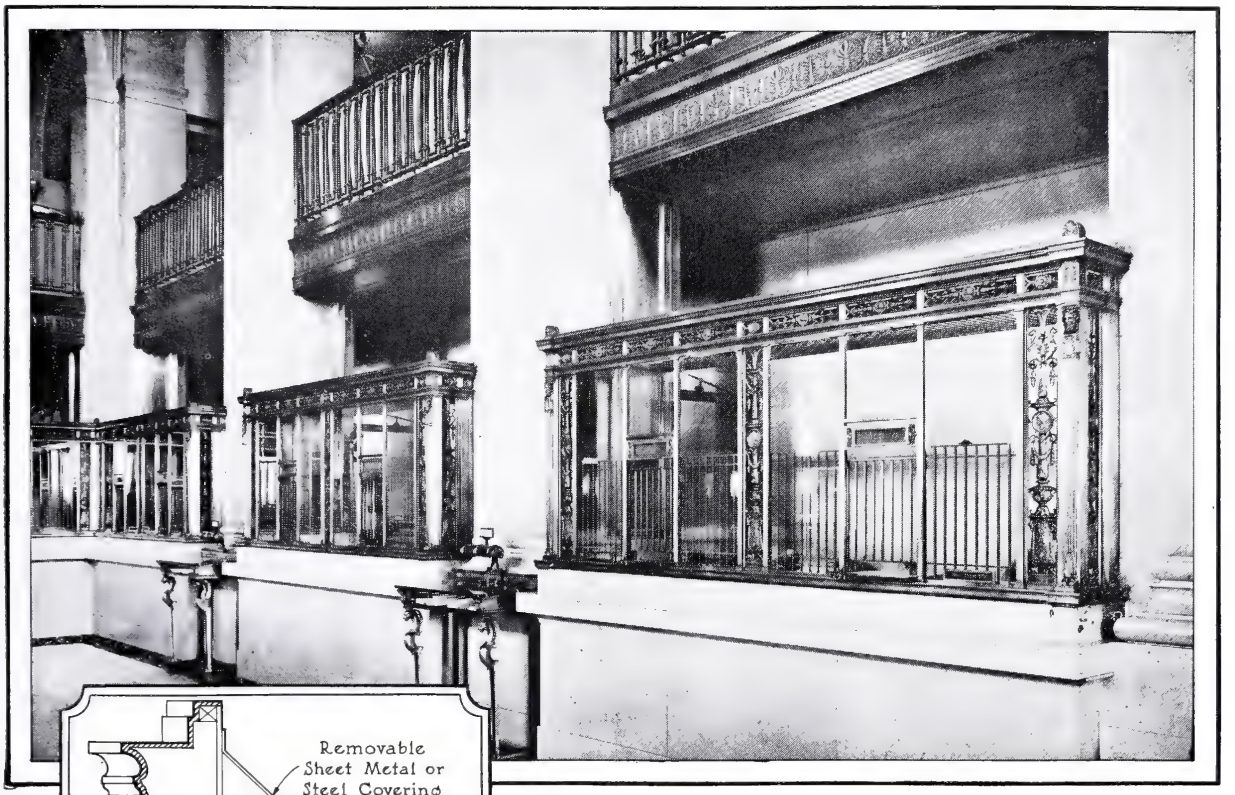
Charles P. Rogers & Co., Inc., 14-16 East 33rd St., New York, N. Y.
A Guide to Buying Quality Furniture, Beds and Bedding. Booklet. 4 x 6 in. Illustrated. Describes the manufacture of good furniture as compared with the ordinary kind.

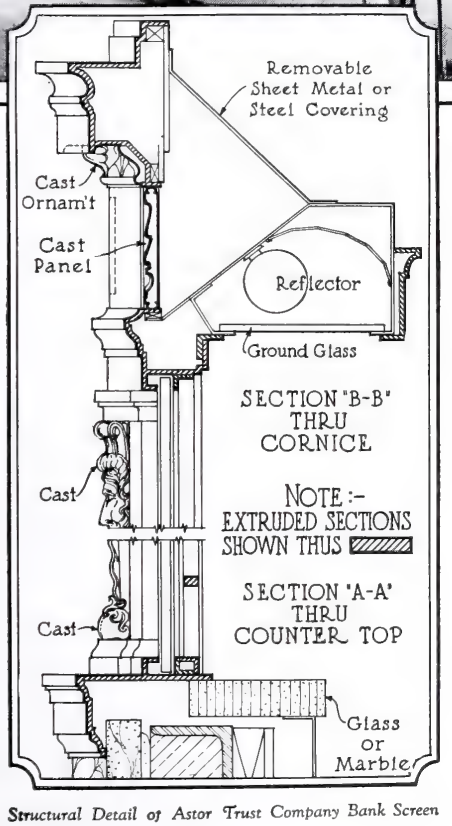
Elgin A. Simonds Company, Syracuse, N. Y.
Furnishing the Home. 24 pp. 6 x 9 in. Illustrated. A treatise on modern interior decoration.

GLASS CONSTRUCTION

Mississippi Wire Glass, 220 Fifth Avenue, New York.
Mississippi Wire Glass. Catalog. 3⅞ x 8½ in. 32 pp. Illustrated. Covers the complete line.

ANACONDA ARCHITECTURAL BRONZE





Structural Detail of Astor Trust Company Bank Screen

Counter Screen of the Astor Trust Company, New York. Charles E. Birge, Architect. Fabricated by the Gorham Company from Anaconda extruded architectural bronze.

IN the banking rooms of the Astor Trust Company the beauty and sharpness of line that characterizes Anaconda extruded architectural bronze has been fully utilized in the counter screen. The extruded bars and shapes have been effectively combined with ornamental bronze castings and sheet bronze panels.

Equally fine examples of the application of Anaconda extruded bronze shapes to distinctive metal construction are to be found in many of the public buildings and residences of the country. Anaconda bronze is used not only for bank screens but for window-frames, doors, store fronts, elevator enclosures and for all interior and exterior metal trimmings.

Prices quoted on application. Send blueprint or sketch of shape required.

THE AMERICAN BRASS COMPANY

GENERAL OFFICES, WATERBURY, CONN.

MILLS AND FACTORIES

Ansonia, Conn. Torrington, Conn. Waterbury, Conn. Buffalo, N.Y. Kenosha, Wis.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 64*

GRANITE—See Stone, Building

HARDWARE

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

McKinney Mfg. Co., Pittsburgh, Pa.
McKinney Cabinet Hardware. Catalog. 6 x 9 in. 32 pp. Illustrated. Describes complete line of hardware for cabinet and furniture work.
McKinney Hardware for Sliding Doors. Booklet. 6 x 9 in. 18 pp. Illustrated. Describes different types of sliding door hardware.

Stanley Works, The, New Britain, Conn.
Wrought Hardware. Catalog. BJ10. 6½ x 10 in. Color plates. Shows all of the Stanley Works products made of steel from their own mills.

Vonnegut Hardware Co., Indianapolis, Ind.
Von Duprin Self-Releasing Fire Exit Devices. Catalog. 12F 8 x 11 in. 41 pp. Illustrated.
"Saving Lives." Booklet. 3¼ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used.

HEATING EQUIPMENT

American District Steam Company, North Tonawanda, N. Y.
Bulletin No. 150-AF. 6 x 9 in. 32 pp. Illustrated. Describes the Adsco System of Atmospheric Steam Heating and explains how it saves 20 to 30% of fuel cost. Tells how to figure radiation.
Catalog No. 21-AF. 6 x 9 in. 200 pp. Illustrated. Lists and describes the full line of equipment and devices manufactured for use on underground and interior steam mains, expansion joints, steam meters, condensation meters, traps, flange fittings, angle fittings, manhole curbs, alignment guides, etc.

Clarage Fan Company, Kalamazoo, Mich.
Catalog No. 52. 8½ x 11 in. 84 pp. Illustrated. Describes Clarage Kalamazoo Multiblade Fans and Heaters for use in schools, churches, hospitals and industrial plants. Engineering data, capacity tables and dimensions included.

James B. Clow & Sons, 534 S. Franklin Street, Chicago, Ill.
Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

Excelso Specialty Works, 119 Clinton St., Buffalo, N. Y.
Excelso Water Heater. Booklet. 12 pp. 3 x 6 in. Illustrated. Describing the new Excelso method of generating domestic hot water in connection with heating boilers. (Firepot Coil eliminated.)

Gorton & Lidgerwood Co., 96 Liberty Street, New York, N. Y.
Gorton Self-Feeding Boilers. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Descriptions, specifications and prices.

Johnson Service Company, 149 Michigan St., Milwaukee, Wis.
Regulation of Temperature and Humidity. Booklet. 11¼ x 8½ in. 64 pp. Illustrated. Describes Johnson system of pneumatic, automatic regulation of temperature and humidity, and illustrates thermostats, valves, air compressors, dampers and other parts.
Johnson Electric Thermostats, Valves and Controllers. Booklet. 6⅛ x 3½ in. 24 pp. Illustrated. Excellent plates showing electric thermostats and controllers.

Kelsey Heating Company, James St., Syracuse, N. Y.
Booklet No. 5. 4 x 9 in. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.
Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.
Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet, giving sizes and capacities.

Kewanee Boiler Co., Kewanee, Ill.
Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.

Minneapolis Heat Regulator Company, Minneapolis, Minn.
The Heart of the Heating Plant. Catalog. 6 x 9 in. 20 pp. Illustrated. Describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used.

Page Boiler Company, The Wm. H., 141 West 36th Street, New York, N. Y.
Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions with specifications of the Volunteer Round and Monarch Square Sectional Boilers: also the Monarch Up-Draft and Down-Draft Smokeless Boiler; with method for apportioning size of boiler and radiation, and other heating data.

United States Radiator Corporation, Detroit, Mich.
The Complete Line. Catalog. 4¼ x 7¼ in. 255 pp. Illustrated. Contains important technical information of special interest to architects and heating engineers.
Capitol Smokeless Type Boilers. Booklet. 8½ x 11 in. 12 pp. Illustrated. Describing a new type of low-pressure heating boiler which burns soft coal without smoke.

Utica Heater Company, Utica, N. Y.
Utica Imperial SUPER-SMOKELESS Boiler. Catalog. 8½ x 11 in. Consists of the following seven bulletins, either loose or bound together: (1) School Heating Bulletin. (2) Public Building Bulletin. (3) Theater Heating Bulletin. (4) Churches and Religious Institutions. (5) Residences, Apartments and Hotels. (6) Offices, Industrial Buildings and Garages. (7) Technical Bulletin describing patented Bunsen Burner design and construction of the SUPER-SMOKELESS BOILER, which burns the cheapest grades of soft coal smokelessly and operates equally well with hard coal, coke or fuel oil.

HEATING EQUIPMENT—Continued

Utica Heater Company—Continued
Imperial Round and Square Boilers and Supplies. Catalog. 3½ x 6½ in. Gives complete data on small heaters.
Special Folders. 8½ x 11 in. "Warmth and Comfort," describing the scientifically correct NEW IDEA pipeless furnaces. "SUPERIOR Warm Air Pipe Furnaces," a standard line of heating equipment for over forty years. "SUPER-SMOKELESS Pipe and Pipeless Furnaces," a new and remarkably efficient warm air heater, burning cheap soft coal without smoke—utilizing the principle of the Bunsen Burner.
"Imperial Sectional Square Boilers," for hard coal heating of all types of buildings.

HEAT REGULATORS—See Heating Equipment

HOISTS

Gillis & Geoghegan, 544 West Broadway, New York.
Hoists for Industrial Plants. Booklet. 6 x 8¾ in. 8 pp. Illustrated. Labor saving service in the lifting or lowering of lighter loads, through the use of G & G Telescopic and Non-telescopic Hoists.
Removing Ashes. Booklet. 6 x 8¾ in. 6 pp. Illustrated. Removing ashes from boiler room directly to wagon by electrically operated Telescopic Hoists.

HOLLOW TILE—See Tile, Hollow

INSULATION

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

Philip Carey Co., The, Cincinnati, Ohio.
Carey Asbestos and Magnesia Products. Catalog. 6 x 9 in. 72 pp. Illustrated.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Bulletin. 8½ x 11 in. Details and specifications for insulating roofs to prevent condensation.

United States Mineral Wool Co., 280 Madison Ave., New York, N. Y.
The Uses of Mineral Wool in Architecture. Booklet. 5¼ x 6⅝ in. 24 pp. Illustrated. Describes properties of mineral wool as insulation against heat, frost, sound. Specifications and section drawings for use as a fireproofing. Rule for estimate and cost.

KITCHEN EQUIPMENT

Wm. M. Crane Company, 16–20 West 32nd St., New York, N. Y.
VULCAN Gas Ranges and Appliances. Booklet. 5 x 8 in. 50 pp. Illustrated. Describes complete line, including VULCAN SMOOTH-TOP Compact Cabinet Gas Ranges for kitchens in the home.
VULCAN Gas Equipment for Hotels, Hospitals, Restaurants, etc. Booklet. 5 x 8 in. 45 pp. Illustrated. Equipment for heavy-duty cooking requirements, with information of value to architects in planning kitchens.

LATH, METAL AND REINFORCING

North Western Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Designing Data. Catalog. 6 x 9 in. 94 pp. Illustrated. Describes most efficient use of Econo Expanded Metal Reinforcing.
Formless Concrete Construction. Catalog. 6 x 9 in. 80 pp. Illustrated. Describes use of T-Rib Chanelath, a form and reinforcing for concrete.

LEADERS AND GUTTERS

Copper & Brass Research Assn., 25 Broadway, New York, N. Y.
Copper Roofing. Booklet. 8½ x 11 in. 32 pp. Illustrated. Gives information regarding weights of various roofing materials. Describes up-to-date practice and methods of laying copper roofs; decorative effects and how to obtain them. Gives specifications and details. Flashings, reglets, gutters and leaders, cornices and copper-covered walls.

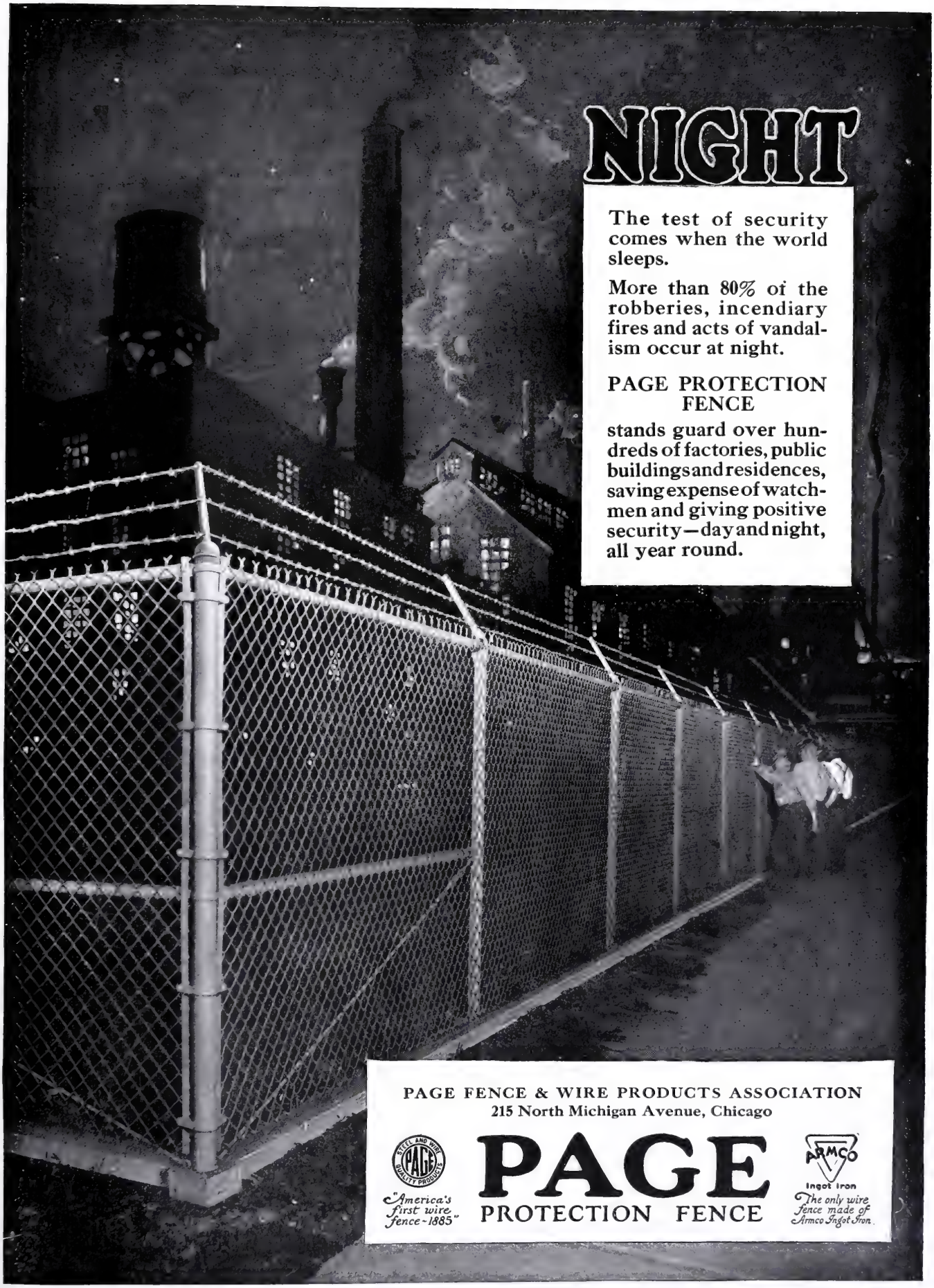
MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

MANTELS

Arnold & North, Inc., 124 East 41st St., New York, N. Y.
Booklet. 5 x 6 in. Contains photographic reproductions of a variety of old English and Colonial mantelpieces with complete information as to sizes and prices.

Arthur Todhunter, 414 Madison Ave., New York, N. Y.
Mantels and Fireplace Equipment. Booklet. 8½ x 11 in. Illustrated. Separate sheet plates showing mantels installed and furnished, also andirons and grates grouped with suitable pieces, also lanterns, weather-vanes and hand-wrought hardware. All sizes and descriptions given on each plate.


NIGHT
The test of security comes when the world sleeps.
More than 80% of the robberies, incendiary fires and acts of vandalism occur at night.
PAGE PROTECTION FENCE
stands guard over hundreds of factories, public buildings and residences, saving expense of watchmen and giving positive security—day and night, all year round.
PAGE FENCE & WIRE PRODUCTS ASSOCIATION
215 North Michigan Avenue, Chicago
"America's first wire fence-1885"
PAGE
PROTECTION FENCE
ARMCO
Ingot Iron
The only wire fence made of Armco Ingot Iron

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 66*

Continued from page 66

MARBLE

The Georgia Marble Company, Tate, Ga. New York office, 1328 Broadway.
Why Georgia Marble is Better. Booklet. 3⅜ x 6 in. Gives analysis, physical qualities, comparison of absorption with granites, opinions of authorities, etc.
Convincing Proof. Booklet. 3⅜ x 6 in. 8 pp. Classified list of buildings and memorials in which Georgia Marble has been used, with names of Architects and Sculptors.

Tompkins-Kiel Marble Company, 505 Fifth Ave., New York, N. Y
Reproductions in natural colors of imported and domestic marbles and stone for interior and exterior uses.
Bulletins, 9¾ x 12¾ in., illustrating buildings of various types in which Tompkins-Kiel Marble Company's imported and domestic marbles and stone have been used.

Vermont Marble Company, Adv. Dept., Proctor, Vt.
The Book of Vermont Marble. Booklet. 8½ x 11 in. 68 pp. Illustrated. A reference book for architects, describing various kinds of Vermont Marble, with illustrations and details.
Marble Banks and Modern Business. Booklet. 7¾ x 10½ in. 48 pp. Illustrated. Contains many pictures of important Vermont Marble bank work, with certain tests and analyses relating to the product.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Brass Company, Waterbury, Conn.
Illustrated pamphlet describes the use and adaptability of extruded architectural shapes to meet the architect's design.

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
Reference Book. Pocket Ed. 2½ x 4½ in. 168 pp. Illustrated Covers the complete line of Sheet and Tin Mill Products.
Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.
Research on the Corrosion Resistance of Copper Steel. Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.
Facts Simply and Briefly Told. Booklet. 8½ x 11 in. 16 pp Illustrated. Non-technical statements relating to Keystone Copper Steel.
Black Sheets and Special Sheets. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.
Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

Bridgeport Brass Company, Bridgeport, Conn.
Seven Centuries of Brass Making. Booklet. 10½ x 8 in. 78 pp. Illustrated in color. A brief history of the ancient art of Brass Making and its early (and even recent) method of production—contrasted with that of the Electric Furnace Process—a twentieth century achievement of the Bridgeport Brass Company.
Tested High-Speed Brass Rod. Booklet. 10½ x 8 in. 16 pp. Illustrated. Short treatise on the manufacture of Brass Rod for use in Screw Machines, with particular reference to improvements originated by the Bridgeport Brass Company.
Handbook for Architects, Engineers & Superintendents. Book. 7½ x 4 in. 100 pp. Illustrated. Descriptive catalog of the products of the Bridgeport Brass Company, prepared especially for architects, engineers and superintendents, fully illustrated, and containing much valuable information.

Copper & Brass Research Assn., 25 Broadway, New York, N. Y.
Copper Roofing. Booklet. 8½ x 11 in. 32 pp. Illustrated. Gives information regarding weights of various roofing materials. Describes up-to-date practice and methods of laying copper roofs; decorative effects and how to obtain them. Gives specifications and details. Flashings, reglets, gutters and leaders, cornices and copper-covered walls.

METAL TRIM—See Doors, Windows and Trim, Metal

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
Clinton Mortar Colors. Booklet. 3½ x 6⅜ in. 8 pp. Illustrated Complete description of Clinton Mortar Colors with color samples

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Cabot, Inc., Samuel, Boston, Mass.
Cabot's Creosote Stains. Booklet. 4 x 8½ in. 16 pp. Illustrated.

S. C. Johnson & Son, Racine, Wis.
The Proper Treatment for Floors, Woodwork & Furniture. Booklet 6¼ x 8⅛ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.
Portfolio of Wood Panels. 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

National Lead Company, 111 Broadway, New York, N. Y.
Handy Book on Painting. Book. 5½ x 3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.
Red Lead in Paste Form. Booklet. 6¼ x 3½ in. 16 pp. Illustrated Directions and formulas for painting metals.
Came Lead. Booklet. 8¾ x 6 in. 12 pp. Illustrated. Describes various styles of lead cames.
Cinch Anchoring Specialties. Booklet. 6 x 3½ in. 20 pp. Illustrated. Describes complete line of expansion bolts.

The Ripolin Company, Cleveland, Ohio
Ripolin Specification Book. 8 x 10¼ in. 12 pp. Complete specifications and general instructions for the application of Ripolin, the original Holland enamel paint. Also directions for proper finishing of wood, metal, plaster, concrete, brick and other surfaces.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES—Continued

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.
Preservative Coatings. Booklet. 6 x 9 in. 15 pp. Illustrated. Presents in a concise manner the properties and uses of the Ruberoid Company's various paint preparations.

Smith & Co., Edward, P. O. Box 76, City Hall Station, New York, N. Y.
Architect's Hand Book. 4¾ x 7½ in. 24 pp. Specifications and suggestions for painting, varnishing, enameling, etc.

Sonneborn Sons, Inc., L., Dept. 4, 264 Pearl Street, New York.
Paint Specifications. Booklet. 8½ x 10¾ in. 4 pp.

The Truscon Laboratories, Detroit, Mich.
Architects' Specification Handbook. 8½ x 11 in. 108 pp. Complete specifications covering Waterproofings, Dampproofings, Oilproofings, Technical Finishes, Steel Paints, Mill White Paints, Floor Hardeners and Varnishes.

PARTITIONS

Improved Office Partition Company, 25 Grant St., Elmhurst, L. I.
Telesco Partition. Catalog. 8¼ x 11 in. 14 pp. Illustrated. Shows typical offices laid out with Telesco partitions, cuts of finished partition units in various woods. Gives specifications and cuts of buildings using Telesco.
Detailed Instructions for erecting Telesco Partitions. Booklet. 24 pp. 8½ x 11 in. Illustrated. Complete instructions, with cuts and drawings, showing how easily Telesco Partition can be erected

The J. G. Wilson Corporation, 11 East 36th St., New York, N. Y.
Folding Partitions. Booklet. 8½ x 11½ in. 16 pp. Illustrated. Covers the field of folding partitions for churches, schools, hotels, clubs and public institutions.
Rolling Partitions, Hygienic and Disappearing Door Wardrobes. Booklet. 6 x 9 in. 32 pp. Illustrated. Describes rolling partitions, particularly in churches and schools, and wardrobes as installed in schools and public institutions.

PARTITIONS, WIRE

Page Steel & Wire Company, Bridgeport, Conn.
Page Standard Panel Partition. Booklet. 8½ x 11 in. 6 pp. Illustrated. Uses and advantages of Wire Partition, with Page Standard Panel Specifications. Valuable to architects.

PIPE

American Brass Company, Waterbury, Conn.
Illustrated pamphlet giving tables of weights and price-lists devoted to Brass and Copper Pipe in iron pipe and plumbers' sizes.

A. M. Byers Company, 235 Water St., Pittsburgh, Pa.
Bulletin 26-A. "What Is Wrought Iron?" 8 x 10¾ in. 40 pp. Illustrated. Descriptions of materials and processes employed in manufacturing Byers genuine wrought iron pipe. Factors influencing corrosion. Gives table of pipe sizes, weights, dimensions, tests, etc., and tabulated records of the life of iron and steel pipe in various kinds of service.
Bulletin 30. An Investigation of Pipe Corrosion in Hot Water Service. 8 x 10¾ in. 20 pp. Illustrated. Shows service records of iron, steel and brass pipe used for hot and cold water supply lines in 129 Pittsburgh Apartment Buildings.
Bulletin 32. Corrosion of Wrought Iron, Cast Iron and Steel Pipe in House Drainage Systems. 8 x 10¾ in. 32 pp. Illustrated. Data obtained through investigations conducted in New York and Chicago by Dr. Wm. P. Gerhard, C.E., and Thomas J. Claffy, Asst. Chief San. Inspector, city of Chicago.
Bulletin 38. The Installation Cost of Pipe. 32 pp. 8 x 10¾ in. Illustrated. Cost analyses of 20 different pipe installations, in power and industrial plants, office buildings, hotels, residences, etc.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "A." 4 x 6½ in. 706 pp. Illustrated. Shows a full line of steam, gas and water works supplies.

National Tube Co., Frick Building, Pittsburgh, Pa.
National Bulletin No. 11, History, Characteristics and Advantages of National Pipe. Catalog. 8½ x 11 in. 48 pp. Illustrated.

Reading Iron Company, Reading, Pa.
Reading Genuine Wrought Iron Pipe in the Making and in Service. Bulletin No. 1. 8½ x 11 in. 32 pp. Illustrated. History of the Reading Iron Company. Origin of wrought iron—description of each process of manufacture of both buttweld and lapweld pipe—Reading Pipe in various fields.
Book of Standards. Booklet. 5 x 7 in. 48 pp. Illustrated. Complete tables showing dimensions, tests and list prices on each of the 552 different kinds of Reading Tubular goods. Two simple tests for distinguishing genuine wrought iron pipe.
The Painted Molecule. Booklet. 4 x 9 in. 8 pp. Illustrated. A brief, non-technical description of the reasons for the longer life of Reading Iron Pipe, with instances of actual service.
The Ultimate Cost. Booklet. 5¼ x 7¼ in. 24 pp. Illustrated in two colors. A comparison in actual figures of the initial cost and the ultimate cost of plumbing and heating systems in several kinds of homes.

PLUMBING EQUIPMENT

American Brass Company, Waterbury, Conn.
Benedict Nickel. Illustrated pamphlet descriptive of Benedict Nickel White Metal for high-grade plumbing fixtures.

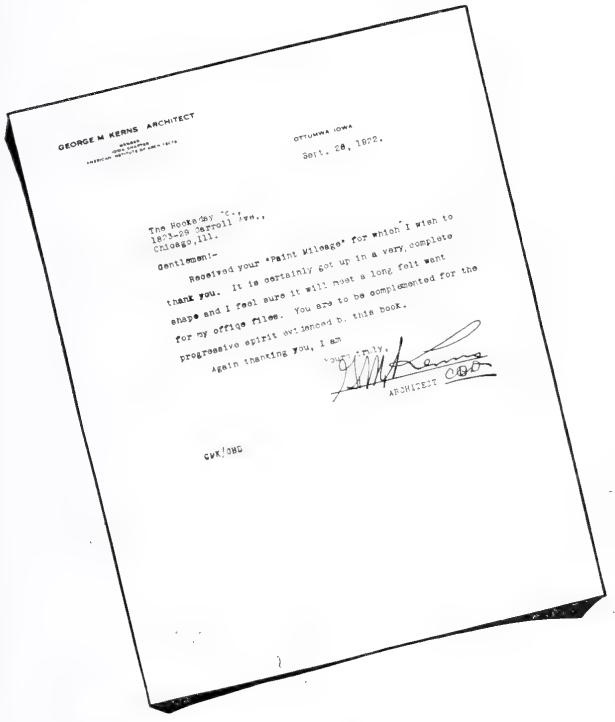
A. P. W. Paper Company, Albany, N. Y.
The Onliwon Cabinet and Paper. Booklet. 5⅞ x 3⅜ in. 24 pp. Illustrated. Contains descriptions, illustrations and specifications of cabinets for serving Onliwon toilet paper and Onliwon paper towels.

Bridgeport Brass Company, Bridgeport, Conn.
Plumbing Supplies. Booklet. 10½ x 8 in. 20 pp. Illustrated. Describes a few of the different plumbing supplies manufactured by the Bridgeport Brass Company.

"Paint Mileage"

Heartily Welcomed by Architects—

The New Hockaday Book of Painting Facts Is Meeting With Splendid Response



GEORGE M KERNS ARCHITECT

OTTUMWA IOWA

Sept. 28, 1922.

The Hockaday Co.,
1823-29 Carroll Ave.,
Chicago, Ill.

Gentlemen:-

Received your "Paint Mileage" for which I wish to thank you. It is certainly got up in a very complete shape and I feel sure it will meet a long felt want for my office files. You are to be complimented for the progressive spirit evidenced by this book.

Again thanking you, I am

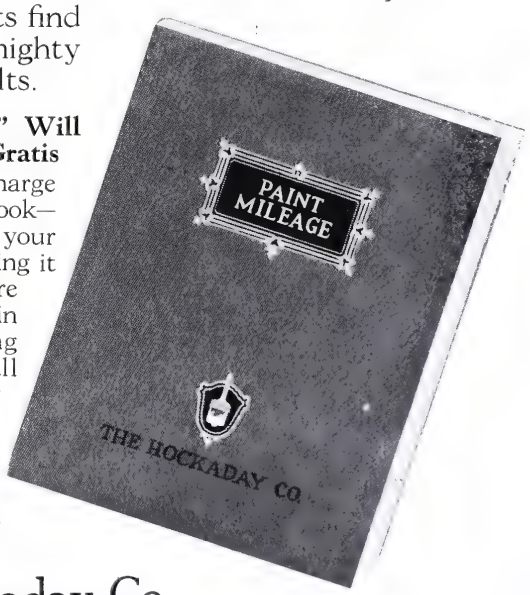
Yours truly,

ARCHITECT

GMK/DMC

IT is indeed gratifying to have an architect write us that our new book, "Paint Mileage" is filling "a long-felt want." We are very proud of this new book which has been so carefully compiled by a paint expert. You can rely on its being absolutely authoritative.

"Paint Mileage" will help you with your interior paint specifications. It will help you solve many paint problems—and you will find yourself referring to it time and time again. Then, too, it tells the story of Hockaday—the washable finish for all inetriors—the interior paint which architects find to be giving mighty satisfying results.



"Paint Mileage" Will Be Sent You Gratis

There is no charge for this splendid book—your request on your letterhead will bring it promptly. If you are at all interested in interior painting problems by all means send for "Paint Mileage." Like Mr. Kerns, we'll warrant it will "meet a long-felt want" in your office.

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"Your book, 'Paint Mileage,' is a very fine book . . . as it contains some very useful information."
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Proudfoot, Bird & Rawson
Des Moines, Iowa

"It's fine!"
Meyer J. Sturm, Chicago, Ill.

"It furnishes us a great deal of valuable information and is useful for our specification writers."
Schack, Young & Myers
Seattle, Wash.

" . . . it will be of material help in painting specification work."
Russ & Karges, Evansville, Ind.

The Hockaday Co.
1823-1829 Carroll Ave., Chicago, Illinois

HOCKADAY

THE WASHABLE FINISH FOR ALL INTERIORS

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 68*

Continued from page 68

PLUMBING EQUIPMENT—Continued

Brunswick-Balke-Collender Co., 623 S. Wabash Avenue, Chicago, Ill.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 4 pp. Illustrated.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 8 pp. Illustrated.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "M." 9¼ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 S. Michigan Avenue, Chicago, Ill.
Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.
Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.
Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.

Eljer Company, 15 E. Van Buren St., Chicago, Ill.
The Standardized Sixteen. Booklet. 3¾ x 6¾ in. 32 pp. Illustrated. Describes fully the complete Eljer line of standardized plumbing equipment, with diagrams, weights, measurements and copious illustrations.

Kohler Co., Kohler, Wis.
Kohler of Kohler. 5½ x 8 in. 48 pp. Illustrated catalog. Shows complete line of plumbing fixtures.

Maddock's Sons Co., Thomas, Trenton, N. J.
Highest Grade Standardized Plumbing Fixtures for Every Need. Catalog. 5 x 7½ in. 94 pp. Illustrated. Covers the complete line.
Bathroom Individuality. Booklet. 6 x 9 in. 28 pp. Illustrated. Showing view of complete bathrooms with complete descriptions of floor plans.
Specifications for plumbing fixtures. Booklet. 9 x 12 in. 8 pp. Tables of specifications for industrial buildings, schools, apartments, hotels, etc.

Speakman Company, Wilmington, Del.
Speakman Showers and Fixtures. Catalog. 4½ x 7½ in. 250 pp. Illustrated. Catalog of Modern Showers and Brass Plumbing Fixtures, with drawings showing layouts, measurements, etc.
Toned Up In Ten Minutes. Booklet. 7½ x 10½ in. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

Wolff Manufacturing Company, 255 No. Hoyne Ave., Chicago, Ill.
Plumbing Suggestions. Catalog. 3¼ x 6 in. 50 pp. Illustrated. Illustrating, describing and pricing Wolff Quality Plumbing Fixtures for residential installation.

PUMPS

Goulds Mfg. Co., The, Seneca Falls, N. Y.
Set of Twenty Bulletins. 7½ x 10⅝ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.
Catalog "K." 6 x 9 in. 216 pp. Illustrated. Covers complete line of smaller size pumps.

RAMPS

Ramp Buildings Corporation, 115 Broad St., New York, N. Y.
The d'Humy Motoramp System of Building Design. Booklet. 8½ x 11 in. 20 pp. Illustrated. Describes the d'Humy system of ramp construction for garages, service buildings, factories, warehouses, etc., where it is desirable to drive motor vehicles or industrial tractors under their own power from floor to floor.
Storage Efficiency of Multi-Floor Garages. Leaflet. 8½ x 11 in. 4 pp. Illustrated. A brief discussion of comparative storage efficiencies of elevator garages, ordinary ramp garages, and d'Humy Motoramp garages.
Visibility. Pamphlet. 8½ x 11 in. 2 pp. Illustrated. Discussion of visibility feature of d'Humy Motoramp System with reference to illustration of one particular installation.
Series of Informal Bulletins on Garage Design. Sent upon request.

ROOFING

American Brass Company, Waterbury, Conn.
Copper Products for Roofing Purposes. Illustrated price-list devoted to copper products, including sheets and rolls, for fabricating into leaders, gutters, flashings, shingles, etc.

American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Better Buildings. Catalog. 8½ x 11 in. 32 pp. Describes Corrugated and Formed Sheet Steel Roofing and Siding Products, black, painted and galvanized, with directions for application of various patterns of Sheet Steel Roofing in various types of construction.
Copper—Its Effect Upon Steel for Roofing Tin. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Philip Carey Co., The, Cincinnati, Ohio.
Architects Specifications for Carey Building Material. 8½ x 11 in. 48 pp. Illustrated.

Copper & Brass Research Assn., 25 Broadway, New York, N. Y.
Copper Roofing. Booklet. 8½ x 11 in. 32 pp. Illustrated. Gives information regarding weights of various roofing materials. Describes up-to-date practice and methods of laying copper roofs; decorative effects and how to obtain them. Gives specifications and details. Flashings, reglets, gutters and leaders, cornices and copper-covered walls.

Creo-Dipt Company, 1025 Oliver St., North Tonawanda, N. Y.
Architectural Service Sheets. 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Illinois Zinc Company, 280 Broadway, New York, N. Y.
Corrugated Sheets of Pure Rolled Zinc. Booklet. 3½ x 8½ in. 8 pp. Illustrated. Describes methods of application for Corrugated Zinc Sheets for roofing or siding. Weights per square. Comparative gauge lists.
The Roof That's Always New. Booklet. 3⅝ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.

ROOFING—Continued

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.
Instructions for Laying Built-up Roofs. Booklet. 8½ x 11 in. Illustrated.
Ruberoid Facts Worth Knowing. Booklet. 6 x 9 in. 16 pp. Illustrated.
Ruberoid Strip-shingle. Booklet. 3½ x 6¼ in. 16 pp. Illustrated in color.
Ruberoid Unit-shingle. Booklet. 3½ x 6¼ in. Illustrated in color.

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.
Selling Arguments for Tin Roofing. Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

SAFETY TREADS

Universal Safety Tread Co., 40 Court St., Boston, Mass.
The Universal Safety Metal Tread. Booklet. 8½ x 11 in. 16 pp. Illustrated. Describes Safety Treads, with lead inserts in steel base, suitable for use on iron, wood or concrete stairs. Also the flat type, with "Alundum" surface, as well as special ladder treads for ships, power-house and engine-room open string stairways.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets. 7¾ x 10¼ in. 46 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

SHEATHING

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

STEEL DRESSERS

Janes & Kirtland, 133–135 West 44th St., New York, N. Y.
The White House Line. Booklet. 7¾ x 5¼ in. 24 pp. Illustrated. Describes and illustrates in detail WHITE HOUSE Steel Dressers and some of the separate units. Also contains typical layout and list of some of our clients.
Photographs. 5½ x 3½ in. Views of actual installations in private residences, schools, etc., sent on request.

STONE, BUILDING

Harrison Granite Company, 200 Fifth Avenue, New York, N. Y.
Harrison Granite Company, Clientele. 3¾ x 8¾ in. 24 pp. Illustrated. A partial list of clients with illustrations of examples of monuments and mausoleums.

Indiana Limestone Quarrymen's Association, Box 766, Bedford, Indiana.
Volume 3. Series A-3. Standard Specifications for Cut Indiana Limestone work. 8½ x 11 in. 56 pp. Containing specifications and supplementary data relating to the best methods of specifying and using this stone for all building purposes.
Vol. 1. Series B. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Vol. 27. Series B. Designs for Houses of Indiana Limestone. 8½ x 11 in. 32 pp. Illustrated. Being the best designs submitted in competition for a detached residence faced with Indiana Limestone conducted by *The Architectural Review.*

Tompkins-Kiel Marble Company, 505 Fifth Ave., New York, N. Y.
Reproductions in natural colors of imported and domestic marbles and stone for interior and exterior uses.
Bulletins, 9¾ x 12¾ in., illustrating buildings of various types in which Tompkins-Kiel Marble Company's imported and domestic marbles and stone have been used.

STORE FRONTS

Brasco Manufacturing Company, 5025 So. Wabash Ave., Chicago, Ill.
Brasco Catalog No. 26. 8½ x 11 in. 28 pp. Illustrated. Catalog illustrating and describing members of the Brasco and Brasco-Hester Construction. Includes copper-covered Brasco moulding and the Hester all metal moulding. The wood core of the Brasco has been creosoted and will last as long as the building.
Full-size Details Brasco Copper Store Front Construction. 8¾ x 11 in. Complete in every particular. Show practical installation of the construction.
Full-Size Details Brasco-Hester Copper Store Front Construction. 8¾ x 11 in. This type is all metal or hollow. Has a dust regulator at the base of the plate which does not stick.

Kawneer Co., The, Niles, Mich.
Kawneer Solid Copper Store Fronts. Catalog "K." 8½ x 11 in. 32 pp. Illustrated. Information about various members used in the pioneer Kawneer construction.
A Collection of Successful Designs. Catalog. 9¼ x 6½ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.

Zouri Drawn Metals Co., B. J. 10, Chicago Heights, Ill.
Architects' Catalog. 8¾ x 11¾ in. 86 pp. Illustrated. Showing a true copy of the approval of the Underwriters' Laboratories. Showing a proper glazing specification, based on the Underwriters' Report.
Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

Broad Street Hospital *William Neal Smith, Architect*
Equipped with HASTINGS ROLUP Screens

The Practical Features of Hastings Rolup Screens

AFTER three years of careful study and extensive experimentation we offer the architectural profession a practical, durable and simple rolling window screen.

Wound on a specially designed roller the HASTINGS ROLUP Screen is easily adjusted to any desired position. It rolls into an inconspicuous zinc box, at the head of the window, which is finished to match the trim and when pulled down it is held in place, thereby closing every crack and crevice. It will not fly up. It stays in any desired position.

The screen cloth is made of Monel Metal, which is rust proof, and *continuous rolling does not harden and crack it.*

Flexible strips of German silver are fastened along the sides of the screen. These act as a strong selvage and protect the delicate edge of the screen cloth. These German silver strips also take all the strain when the screen is being rolled up and down.

Inconspicuous rails finished to match the trim are attached to the sides of the window and into these rails the screen is automatically locked as it rolls up and down.

The HASTINGS ROLUP Screen *will not pull out at the sides.* It will stay in any position and is held firmly in place—it cannot bulge, buckle or fly up. The box may be concealed at the head and the guide rails encased in the stop if desired.

HASTINGS ROLUP Screens fit any type of window; are installed inside or out and are never taken out of the window. They are the ideal screens for casements and their many advantages make them most desirable for all types of windows.

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ROLUP SCREEN COMPANY - 410 East 32nd Street, New York City

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 70*

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

STUCCO, MAGNESITE

American Magnestone Corporation, Springfield, Ill.
Catalog. 13 pp. Describes the quality, beauty and strength of Magnestone.

American Materials Company, 101 Park Avenue, New York; Weed Street and Sheffield Avenue, Chicago, Ill.
Elastica, the Stucco of Permanent Beauty. Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.

Muller & Co., Franklyn R., Waukegan, Ill.
Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.

United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

TELEPHONE SYSTEMS

Federal Telephone & Telegraph Company, 1738 Elmwood Ave., Buffalo, N. Y.
Catalog No. 610. Booklet. 8½ x 10 in. 24 pp. Illustrated. Interior telephones for home, office, factory, hotel and apartment-house use.

TERRA COTTA

Atlantic Terra Cotta Co., 1170 Broadway, New York, N. Y.
Questions Answered. Booklet, 7½ x 5¼ in. 32 pp. Illustrated. A synopsis of questions most frequently asked by architects in relation to terra cotta, with brief but complete answers; contains many illustrations.

National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.
Standard Construction, Indexed, bound volume. 10½ x 16 in. 90 pp. 70 Illustrations. Standard forms of terra cotta construction with short article.
"The School." 10½ x 13½ in. 34 pp. 92 Illustrations. Types of school buildings with short descriptive articles. Volume I, brochure series.
"Better Banks." 10½ x 13½ in. Illustrated. Banks of various sizes, with short descriptive articles.
"Terra Cotta Defined." 10½ x 13½ in. Complete description of Terra Cotta and its uses.

The New Jersey Terra Cotta Co., Singer Bldg., New York, N. Y.
Store Fronts in Architectural Terra Cotta. Booklet. 8½ x 11 in. 44 pp. Illustrated. Photographs, measured drawings, designs and illustrations of decorative motifs make up an interesting booklet which will be forwarded upon request.

Northwestern Terra Cotta Co., The, 2525 Clybourn Ave., Chicago, Ill.
Booklet. 8¼ x 11 in. 77 pp. Illustrated. Showing in a concise way the usefulness of terra cotta.

THERMOSTATS—See Heating Equipment

TILE, FLOOR AND WALL

Associated Tile Manufacturers, The, Beaver Falls, Pa.
Bring the Crowds to Your Market. Booklet. 8½ x 11 in. 16 pp. Illustrated. The use of Tile for the modern sanitary market.
Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. A handbook on swimming pools and their construction.

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Bldg., Chicago, Ill.
Handbook of Hollow Building Tile Construction. 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Wall Construction Bulletin 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
Industrial Housing Bulletin 172. 8½ x 11 in. 14 pp. Illustrated. Photographs and floor plans of typical workingmen's homes.
Natco on the Farm. 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.
Fireproof Buildings of Natco Hollow Tile. Booklet. 8½ x 11 in. 16 pp. Illustrated. Showing the use of Natco Hollow Tile for private residences.

VALVES

Crane Co., 836 S. Michigan Ave., Chicago, Ill.
No. 50 Steam Pocket Catalog. 4 x 6½ in. 775 pp. Illustrated. Describes the complete line of the Crane Co.

Jenkins Bros., 80 White Street, New York.
The Valve Behind a Good Heating System. Booklet. 4½ x 7¼ in. 16 pp. Color plates. Description of Jenkins Radiator Valves for steam and hot water, and brass valves used as boiler connections.
Jenkins Valves for Plumbing Service. Booklet. 4½ x 7¼ in. 16 pp. Illustrated. Description of Jenkins Brass Globe, Angle Check and Gate Valves commonly used in home plumbing, and Iron Body Valves used for larger plumbing installations.

VENETIAN BLINDS

Burlington Venetian Blind Co., Burlington, Vt.
Venetian Blinds. Booklet. 4½ x 7½ in. 32 pp. Illustrated. Describes the "Burlington" Venetian blinds, method of operation, advantages of installation to obtain perfect control of light in the room.

VENTILATION

Clarage Fan Company, Kalamazoo, Mich.
Catalog No. 52. 8½ x 11 in. 84 pp. Illustrated. Describes Clarage Kalamazoo Multiblade Fans and Heaters for use in schools, churches, hospitals and industrial plants. Engineering data, capacity tables and dimensions included.

WALL BOARDS

Carey Co., The Philip, Cincinnati, Ohio.
Carey Board for Better Building. Catalog. 6 x 9 in. 32 pp. Illustrated.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Walls of Worth. Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

WATERPROOFING

Ruberoid Co., The, 95 Madison Ave., N. Y.
Impervite. Circular. 8½ x 11 in. 4 pp. Illustrated. An integral waterproofing compound for concrete, stucco, cement, mortar, etc.

Sandusky Cement Co., Dept. F., Cleveland, Ohio.
Medusa Waterproofing. Booklet. 6¾ x 9 in. 38 pp. Illustrated.

The Truscon Laboratories, Detroit, Mich.
Science and Practice of Integral Waterproofing. 4 x 9 in. 33 pp. Illustrated. Discusses why concrete requires waterproofing and properties an integral waterproofing must possess. Full specifications for waterproofing mass concrete, cement stucco and cement plaster coat.

WATER PURIFIERS

Wallace & Tiernan Company, Newark, N. J.
Protecting N. Y. Water Supply. Booklet. 10 x 7 in. 24 pp. Illustrated. Describes the chlorinating equipment used for sterilizing N. Y. City water supply; also equipment suitable for sterilizing water supplies of municipalities, industrial plants, private residences, etc.

WATER SOFTENERS

Permutit Company, The, 440 Fourth Ave., New York, N. Y.
Permutit-Water softened to No (Zero) Hardness. Booklet. 8½ x 11 in. 32 pp. Describing the original Zeolite process of softening water to zero hardness. An essential for homes, hotels, apartment houses, swimming pools, laundries, textile mills, paper mills, ice plants, etc., in hard water districts.

WINDOW HARDWARE

American Chain Company, Inc., Bridgeport, Conn.
American Sash Chain. Booklet. 3½ x 6 in. 8 pp. Illustrated. Describes and illustrates American Sash Chain and Sash Fixtures.

The Kawneer Company, Niles, Mich.
Kawneer Simplex Windows. Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.
Detail Sheets and Installation Instructions. Valuable for architects and builders.

Samson Cordage Works, Boston, Mass.
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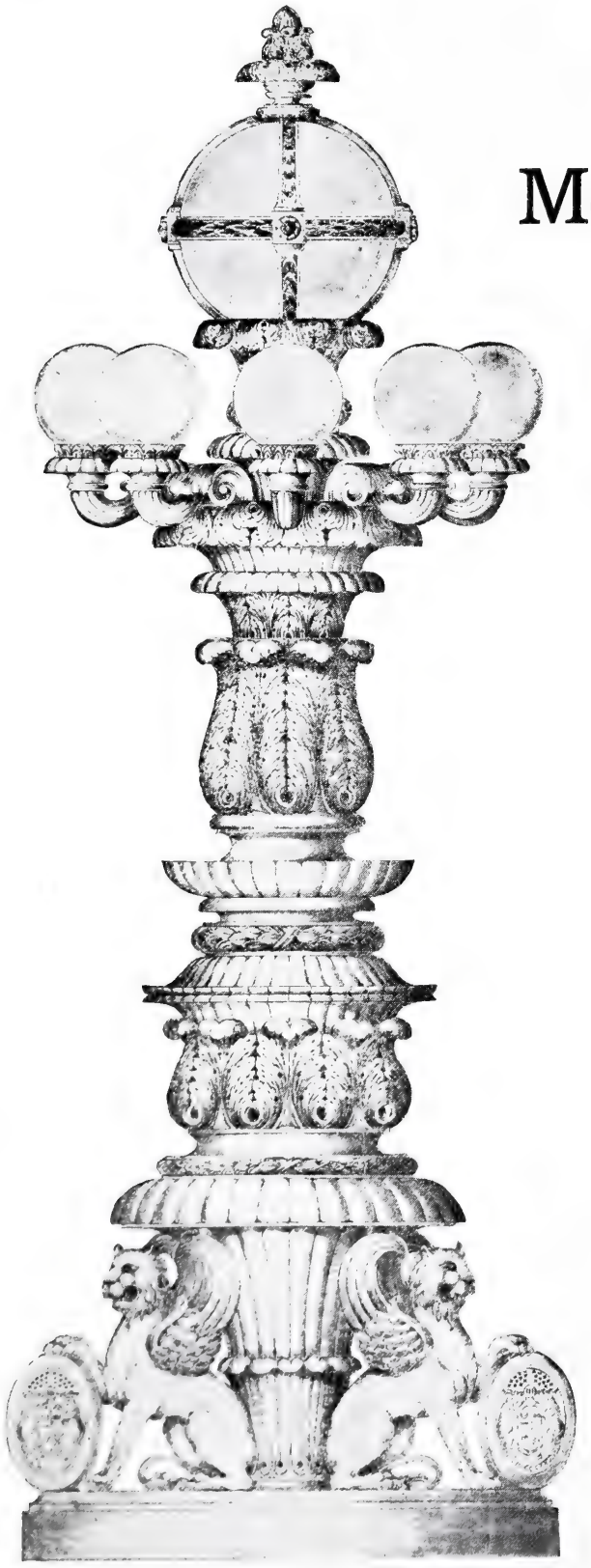

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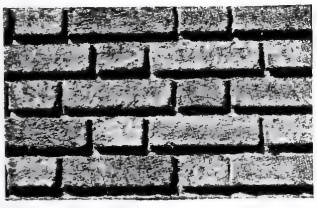

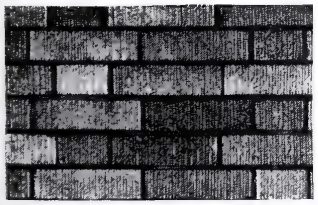

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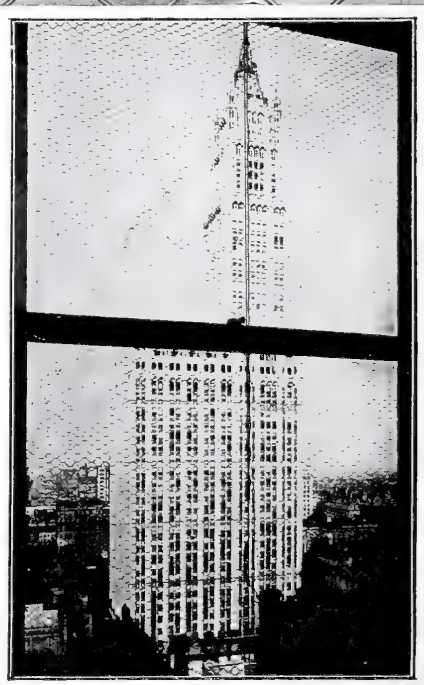

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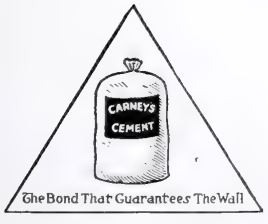

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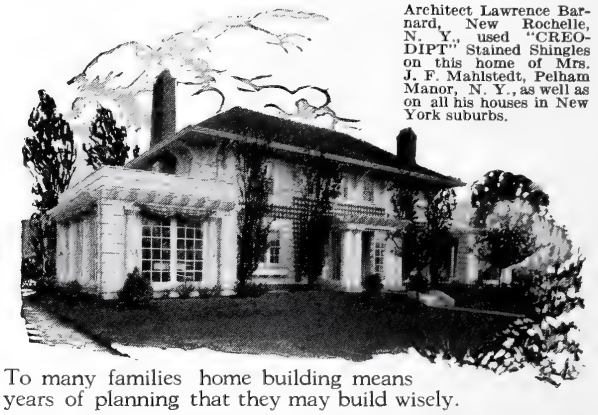

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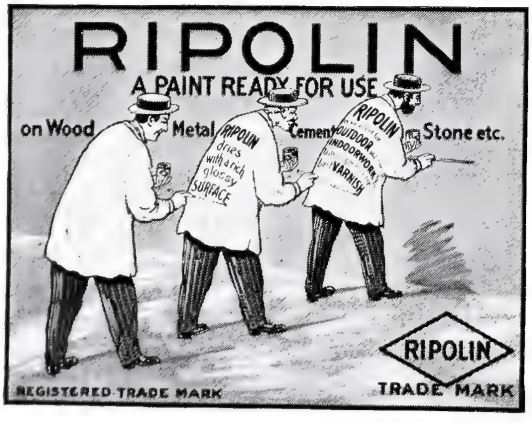

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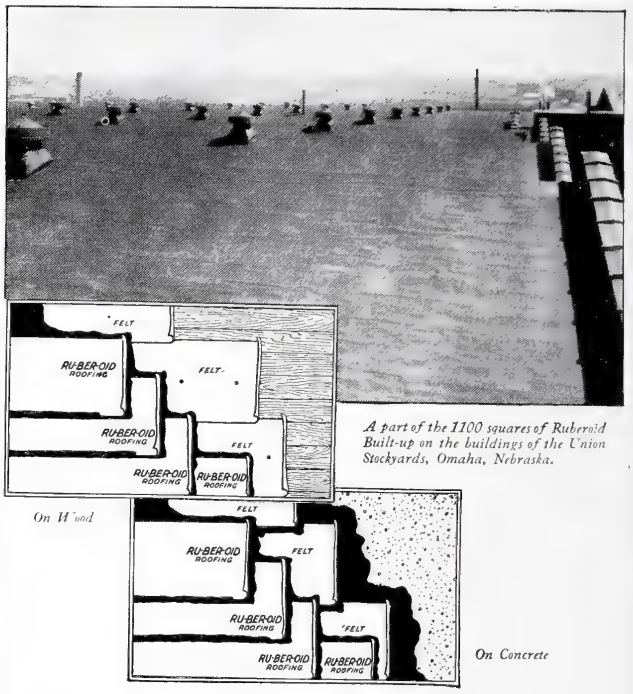

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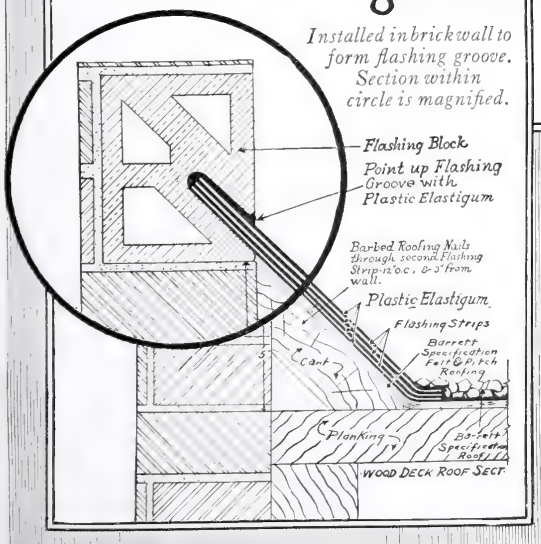

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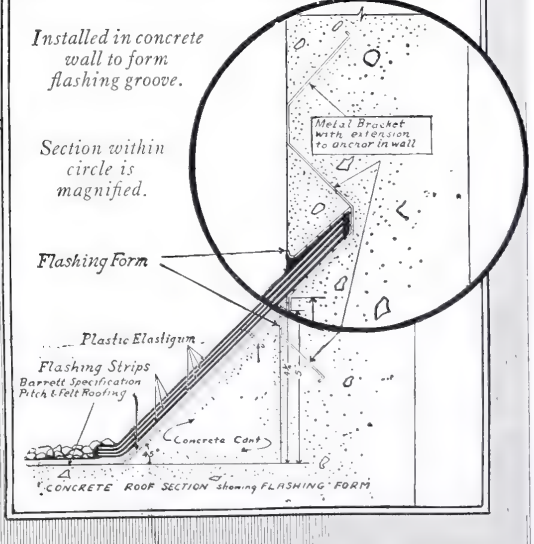

Pete Croatch: Roofer

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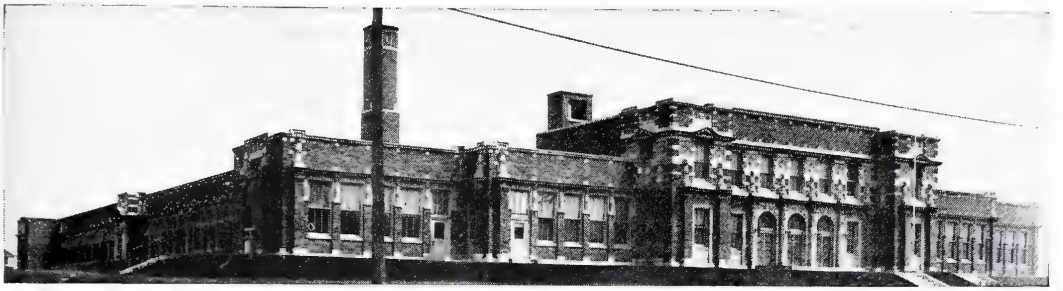

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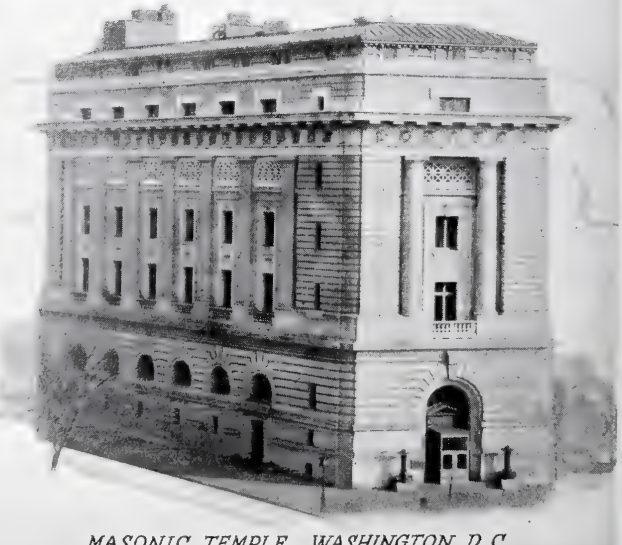

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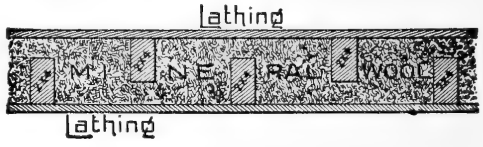

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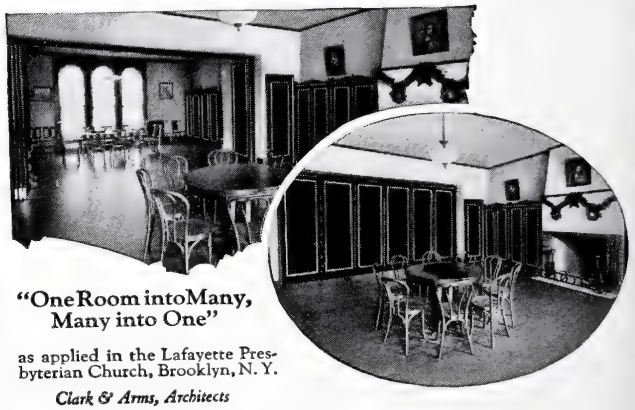
SENECA FALLS, N. Y.

GOULDS



"One Room into Many, Many into One"

as applied in the Lafayette Presbyterian Church, Brooklyn, N. Y.
Clark & Arms, Architects

WILSON

Standard for Forty-six Years

Sectionfold—PARTITIONS—Rolling

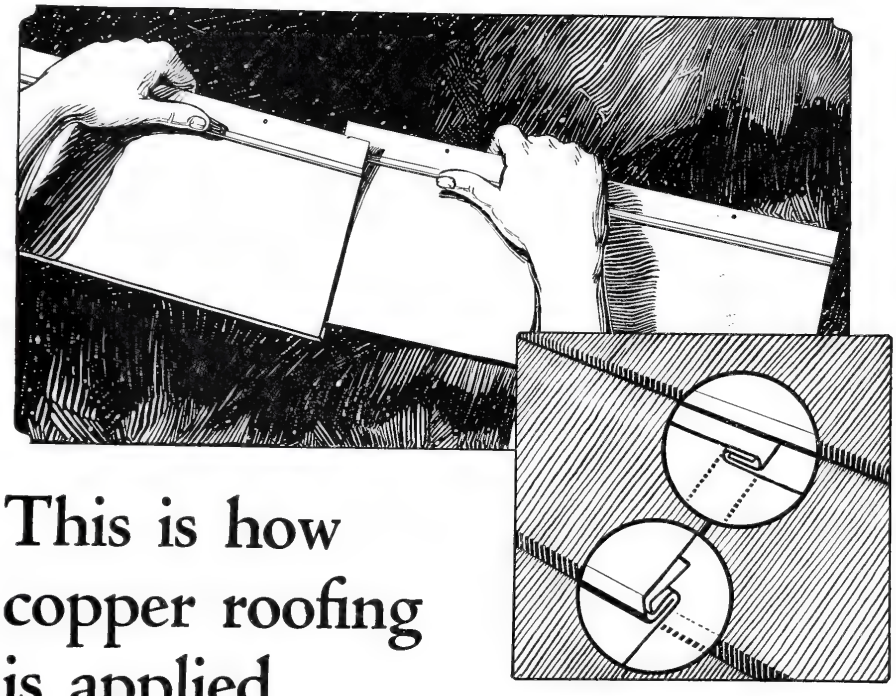
FOR SCHOOLS, CHURCHES, OFFICES
HOTELS, CLUBS, PUBLIC BUILDINGS

Easy and instant subdivision of large rooms. Harmonize perfectly with interior decoration. Prices reduced.

Specifications in Sweet's Catalogues
Write for Illustrated Booklets

THE J. G. WILSON CORPORATION
GENERAL OFFICES, 1 EAST 36th ST., N. Y.

Branch Offices in Principal Cities



This is how copper roofing is applied

ANACONDA Copper Roofings are so simple in construction that installation costs are most moderate. They are laid in courses, with deep butts and an entire absence of stiff mechanical lines.

Though free to expand and contract, Anaconda Copper Roofings are so firmly interlocked by patented joints that the roof is permanently weather-proof.

The rich coloring or patina of copper, usually associated with age, is immediately available through a special pre-oxidization process.

Anaconda Roofs are beautiful, easy to apply, light in weight, moderate in price, and entirely free from upkeep costs.

LIST OF COLORS—Red, *Autumn;* Brown, *Russet;* Green, *Olive;* Green, *Verdi;* Green, *Emerald;* Green, *Blue;* Blue, *Peacock*

Write for illustrated booklet, specification sheets and detailed data.

Manufactured by ANACONDA COPPER MINING COMPANY

Distributed by ANACONDA SALES COMPANY, *Metal Roofing Department*

25 BROADWAY, NEW YORK

THE GLIDDEN COMPANY, CLEVELAND, OHIO, *and its affiliated Companies*

Heath & Milligan Manufacturing Company, Chicago
Adams and Elting Company, Chicago
Campbell Paint & Varnish Company, St. Louis
Campbell Paint & Varnish Company, Dallas
The A. Wilhelm Company, Reading, Pa.
T. L. Blood & Company, St. Paul, Minn.
The Glidden Co. of California, San Francisco
American Paint Works, New Orleans
Twin City Varnish Company, St. Paul, Minn.
The Forest City Paint and Varnish Company, Cleveland
Nubian Paint and Varnish Company, Chicago
The Glidden Company of Massachusetts, Boston
The Glidden Company of Texas, Dallas
In Canada: The Glidden Company, Limited, Toronto, Ontario

RICHARDS & COMPANY, 125 BEVERLY ST., BOSTON, MASS.

ANACONDA COPPER ROOFINGS

© 1922, Anaconda Copper Mining Co

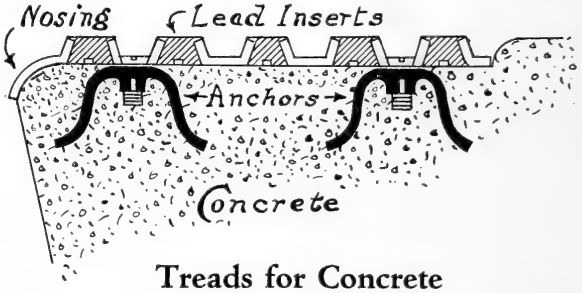
THE PROBLEM OF CONCRETE STAIRS
—*answered by* Universal Safety Treads

SAFETY on concrete stairs must be provided. Also an effective means of protecting the edges from being chipped and broken must be found.

A special type of *Universal Safety Tread* has been devised that meets both conditions and is installed with the least possible effort.

The Concrete Stair is not complete without this protection and the added necessity of providing safe travel conditions should induce architects to give serious attention to this important detail.

Universal Safety Tread Co.
40 Court St., Boston, Mass.



Treads for Concrete

THE safety wearing surface is provided as in our usual tread by non-slip lead inserts that extend completely through a steel or brass base plate and are permanently interlocked.

Special anchors with wide projecting flanges are attached to the under side of the treads with machine screws and the treads then embedded in the concrete before it sets. The anchors cannot work loose and the steel nosing gives a strong protection for the weakest part of the step.

An EVANS VANISHING DOOR Product
FOR SCHOOLS

That Pays for Itself With
FLOOR SPACE SAVED
WARDROBES, Class A

made with panel Backs, Ends and Divisions, and with doors that swing — not slide — on double pivoted arms, no guides, tracks or rollers, no rattle or squeak; they rate 100% in conservation of space, easy and noiseless operation, perfect sanitation and ventilation. Doors cannot stick or bind. Hardware can be purchased separately.

More than a Million hang their wraps in Evans Vanishing Door Wardrobes

Trade Mark VANISHING DOOR U. S. Reg.

Catalog "PICTURES THAT TALK" Sent on Request

W. L. EVANS
709-711 East Main Street **Washington, Ind.**

"Giant Metal," "Red Metal" and Steel
SASH CHAINS

CABLE CHAIN

"Giant Metal" Sash Chain is made of a phosphor bronze mixture controlled by us, and is entirely free from zinc or any impurities. Its tensile strength and durability have never been surpassed for Sash Chain purposes.

"Red Metal" Sash Chain is also made from a special composition, and, with the exception of "Giant Metal," will out-test, gauge for gauge, any other chain on the market.

Steel Sash Chain manufactured by us is made from the best cold rolled steel obtainable, and can be furnished in various finishes, such as copper plated, sherardized or galvanized.

Cable Chains made in copper and steel are an outgrowth of our connection with the building trade. They are manufactured in eight different sizes and are especially adapted for use where heavy weights are employed.

See page 1191, Sweet's Catalog

The Smith & Egge Mfg. Co.
BRIDGEPORT, CONN.
ORIGINATORS OF SASH CHAINS

HIGGIN ALL METAL WINDOW SCREENS

Good Samaritan Hospital, Cincinnati, O., Gustave Drach, Architect. Constructed in two units. Completion of building program withheld until expansion is required. Higgin Screens throughout.

Why Are Noted Hospitals Screened With Higgin Screens?

The first investment in the best hospital screening is a considerable amount, but upkeep and replacement of poor screening is much more costly.

Therefore well-managed and well-built hospitals invest in permanent, all-metal Higgin Screens because they are non-rusting, rot-proof, exact in fit, rigid, re-wireable and practically indestructible.

The first cost of Higgin All-Metal Screening is the last cost.

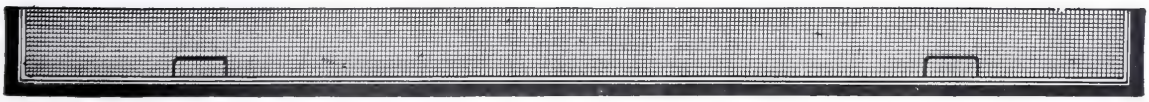
Higgin Service Offices are Maintained in most cities to co-operate with Architects and builders. Higgin Screens are installed by Higgin fitters and every installation is guaranteed.

SEE OUR CATALOGUE IN SWEET'S

The HIGGIN Mfg. Co.
Newport, Ky.
Toronto, Canada.

Service offices in all principal cities in the United States and Canada.

Look in your telephone or city directory for the address of your local Higgin service office.



SARGENT HARDWARE

HOTEL McALLISTER
Miami, Fla.

FRANK V. NEWELL
Architect

IT is probable that the insistent requirements of modern hotel buildings tax the resourcefulness of hardware manufacturers as greatly as do those of buildings belonging to any class. Artistic appearance combined with absolute security are prime essentials.

SARGENT

Locks and Hardware

have equipped many of the most modern hotels.

SARGENT & COMPANY

NEW HAVEN, CONNECTICUT

NEW YORK CHICAGO

SARGENT products have created standards in hardware for more than sixty years

Corbin Automatic Exit Fixtures

Applied to doors opening outward. The doors can be opened from the inside, even when locked against entrance. The slightest push on the exit bar exerts powerful leverage, which immediately releases the latch bolts and swings the door open.

YOU can't afford to take a chance with exit fixtures.

You know what happens when exits don't work in critical situations. A fire or panic in a school, theatre or public building gets front-page scare heads every time.

—and who is blamed? The owner, of course. But whom does the owner blame?

No architect who is professionally conscientious will fail to see that any building he designs for the use of many people is equipped with automatic, unfailing exit fixtures. To slight this detail can damage a reputation.

The hundreds of schools, theaters, churches, office and public buildings, loft buildings and factories in which Corbin Automatic Exit Fixtures stand guard over human life, are the very best evidence of the merit of these fixtures.

Corbin Exit Fixtures have the characteristics that you always associate with a Corbin product—they work, and can be absolutely relied on in an emergency.

P. & F. CORBIN SINCE 1849 NEW BRITAIN CONNECTICUT

The American Hardware Corporation, Successor

NEW YORK CHICAGO PHILADELPHIA

More Book and Less Pencil

PLANNING a garage entrance can be a simple matter of selecting one of the many types of doors illustrated and described in the booklet—"McKinney Complete Garage Sets."

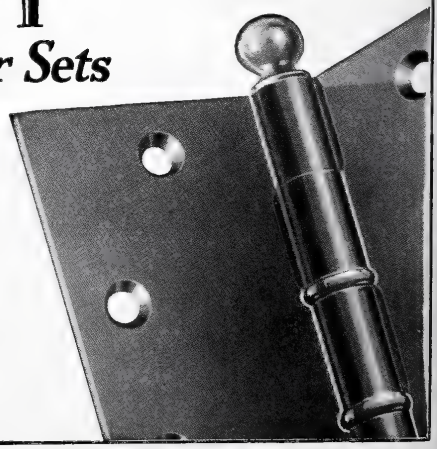
For any dimensions of entrance width or space allowance there is a swinging, sliding-folding or around-the-corner door to fit. Beside each type of entrance illustrated is shown the particular McKinney Complete Garage Set to be used in its installation. Simple working plans for the erection of the door are also given.

The McKinney Garage Sets are made according to the McKinney standard—quality always. Each set is packed complete in a single box, and numbered. Specify this number on the plan and the purchaser of the hardware cannot make any mistake.

Builders will find this booklet helpful, too, when called upon to advise garage owners what kind of an entrance to construct, and to select the hardware for the erection of the doors. We will be glad to send this booklet to any Architect or Builder.

McKINNEY MANUFACTURING CO., PITTSBURGH
Western Office, Wrigley Bldg., Chicago Export Representation

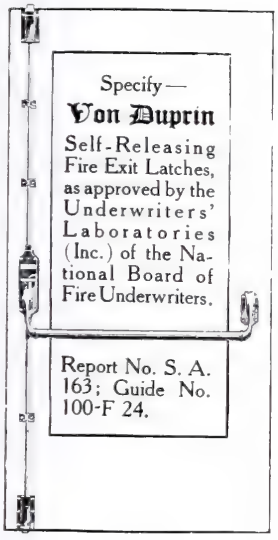
McKINNEY
Complete Garage Door Sets



Also manufacturers of hinges and butts, door hangers and track, door bolts and latches, shelf brackets, window and screen hardware, cabinet hardware, steel door mats and wrought specialties.

Von Duprin

Self-Releasing Fire Exit Latches



On Duty

Day after day, night after night, during the entire life of the building, the Von Duprin latches you install on the doors are on duty.

Their vigilance is mechanical—and never-ceasing.

During the time the building is in active use, they make door operation simpler and easier.

And at all times they guard and protect the lives of those who work or sleep or play in the building. They keep out intruders, yet are always ready to release the inmates instantly, easily, automatically—at the mere touch of hand or body on the cross bar.

The services of these Von Duprin "watchmen" cost very little—and are worth much.

Ask us to send Catalog 12-F, or see "Sweet's," pages 1323–1327.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Christian Science Church, Lakewood Ohio
Charles B. Faulkner, Chicago, Architect
C. R. Cummings Construction Co. Cleveland, Contractors

Economical

BY specifying Brasco Copper Store Fronts you make a real and worth-while saving for your clients. Brasco costs less than any other similar product of equal quality. Quantity production makes Brasco less expensive to use, but does not in any way lessen Brasco quality.

Besides being most economical Brasco Copper Store Fronts excel in endurance, safety to glass, and utmost satisfaction through long service.

Creosoted cypress—the wood eternal—encased in lake copper coverings—insures absolute safety to the glass and makes a vibration-free setting of great permanence.

We have for you a Portfolio of full size details of Brasco Store Fronts —also of the Hester type all-metal fronts with a regulator that actually functions. May we send you a copy?

Detail of Brasco corner-bar construction. Also supplied in Brasco-Hester all-metal or hollow type construction

See our advertisement on page 928 of Sweet's

Brasco

BRASCO MANUFACTURING CO.
5031 SOUTH WABASH AVENUE, CHICAGO, ILLINOIS

Samson Spot Sash Cord

Made of extra quality stock, carefully inspected, and guaranteed free from all imperfections of braid or finish. Can be distinguished at a glance from common cord by our trade mark, the Colored Spots.

Samson Wire Center Sash Cord

For heavy windows, or where for any reason a metallic device is required. A special quality enameled steel wire cable, with a braided cotton cover of the same quality as Spot Sash Cord with the same trade mark. Many times more durable than unprotected metallic devices, noiseless and attractive in appearance. Send for tests, samples and full information.

Samson Cordage Works
Boston, Mass.

STANLEY
"Detail Manual"

Showing correct application of

STANLEY { Butts, Bolts, Blind Hardware, Storm and Sash Hardware, Garage Hardware }

and telling "How to Specify" in every case

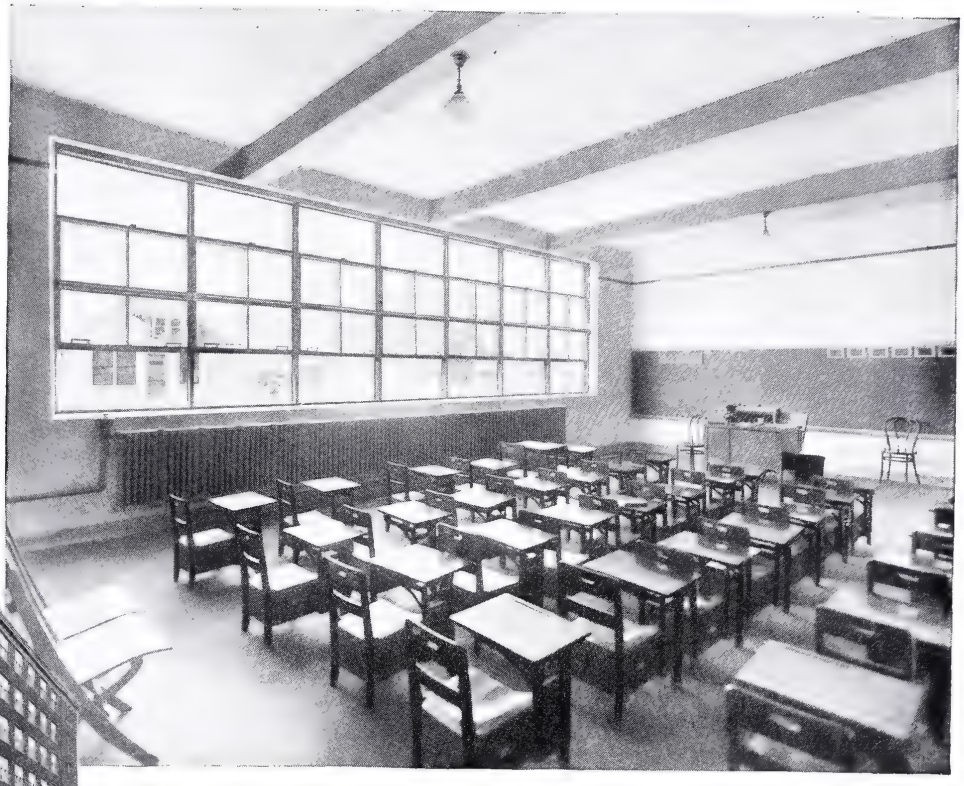
Ask for "Detail Manual, AF-5"

STANLEY S.W.

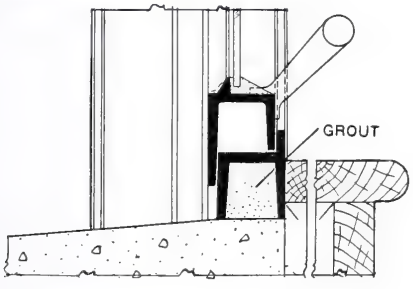
THE STANLEY WORKS
New Britain, Conn.

New York Chicago San Francisco
Los Angeles Seattle

Liberty School, Highland Park, Mich.
Wells D. Butterfield Architect
Lupton Counterbalanced Sash used. Note location of shade rollers at middle of window's height



Midvale Steel & Ordnance Co. offices Philadelphia
Thos. B. Lippincott Architect
Lupton Counterbalanced Sash used



Lupton Counterbalanced Sash

Steel Windows for all types of buildings

Ventilation Made Certain

Lupton Counterbalanced Sash was first suggested by the fact that most persons don't bother to open the upper sash. Their heels get fresh air, but their heads don't.

In Lupton Counterbalanced Sash, the upper and lower sash are hung over one set of pulleys so that they open or close together. Uniform air renewal is thereby made certain. Large offices and schools, and high-grade industrial buildings, are especially benefited by this semi-automatic provision for ventilation.

Sash members and frame are heavy, solid steel sections; corners of sash are oxy-acetylene welded. For schools and offices, zinc weathering is recommended. Sill is of special design minimizing the horizontal surface exposed to weather, and is of copper-bearing steel for still further protection.

Standard sizes and full data are in Catalogues No. 110 and No. 111—in your files. Owing to its simple design, the manufacturing cost of Lupton Counterbalanced Sash is unusually low for a window of such high intrinsic quality.

DAVID LUPTON'S SONS COMPANY
Witte & Tulip Sts., Philadelphia

*Chicago	New York	Pittsburgh	Boston	St. Louis
*Cleveland	*Detroit	*Buffalo	Baltimore	*Atlanta

*Warehouses in these cities — *Agents in other cities*

Canadian Manufacturers: The A. B. Ormsby Co., Ltd., Toronto

Lupton
INVESTMENT VALUE

Your Share in Saving Millions!

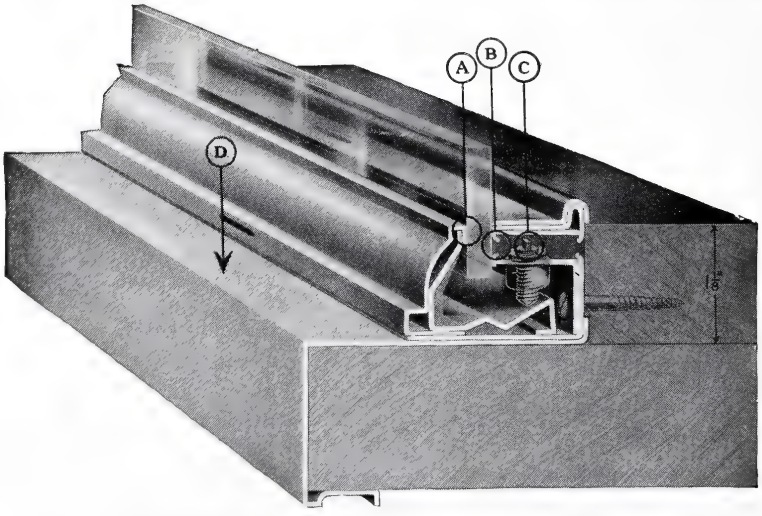
Insurance statistics show that plate glass breakage due to faulty setting runs up a huge bill totaling millions of dollars a year. This great sum does not include the merchant's loss of time and show window space.

Here is a flagrant national waste which can be ended. When plate glass is correctly set the chief cause of breakage is eliminated. You can do your share in saving these millions by seeing that all your store front specifications include the following

Glazing Specification

All Metal Sash, Corner Bars, Division Bars and Self-Adjusting Setting Blocks Used in Store Fronts Must Be Listed by the Underwriters' Laboratories

A is the point where the outer member presses against the glass, when the delicate, watchlike turning of the key at C brings the glass automatically into contact with the rabbet of gutter B sliding on the anti-friction Murnane Self-Adjusting Setting Block.



The Sill Covering D extends from the inner side of the rabbet to the lower edge of the face, eliminating joints —perpendicular screws or nails — positively protecting the wood against deterioration, for leakage is impossible.

No. 110 Zouri Combination Key-Set Sash and 705 Sill Covering

The financial burden of plate glass breakage is borne alike by insurance company, manufacturer, merchant and consumer. By far the greater part of such breakage can be prevented by the installation of Zouri Key-Set Construction.

The Underwriters' Laboratories have listed all Zouri Key-Set Sash, Corner, Division Bars and Self-Adjusting Blocks.

Zouri Drawn Metals Company

Factory and General Offices

1630 EAST END AVENUE - - - CHICAGO HEIGHTS, ILLINOIS

DAHLSTROM

A Corridor in the Mail Service Building, New York City, Showing Dahlstrom Hollow Metal Doors, Picture Moulding, Borrowed Lights, Etc., all of which help to make this truly a fireproof building.

WARREN & WETMORE,
Architects,

JAMES STEWART & CO.,
Gen. Contrs.

DEMANDS AND POSSIBILITIES

A striking example of Dahlstrom possibilities as well as the demand for Dahlstrom doors and trim was recently clearly shown.

In addition to the above installation, six other contracts for New York City buildings alone, together with other work for all over the world, were being fabricated in the Dahlstrom plant at the same time.

DAHLSTROM METALLIC DOOR COMPANY

425 Buffalo Street, Jamestown, N. Y.

New York Office
25 Broadway

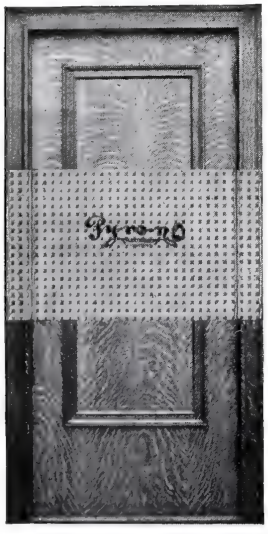
Detroit Office
1331 Dime Bank Building

Chicago Office
19 So. LaSalle St.

Representatives in All Principal Cities

Py-ro-no
TRADE MARK REGISTERED

FIREPROOF VENEERED DOORS *AND* TRIM



Magnified section before veneer is applied

Showing asbestos sheathing indented into core

PYRONO doors and trim are recommended for use in office buildings, hotels, hospitals, apartments, schools and similar types of buildings for the openings to stairways, elevators, pipe shafts, corridor and room partitions and wherever ornamental, fireproof doors are desired.

Pyrono doors and trim are furnished in any design desired and in any cabinet wood. They are installed by carpenters just as regular hardwood doors and trim are installed.

A Few Notable Installations

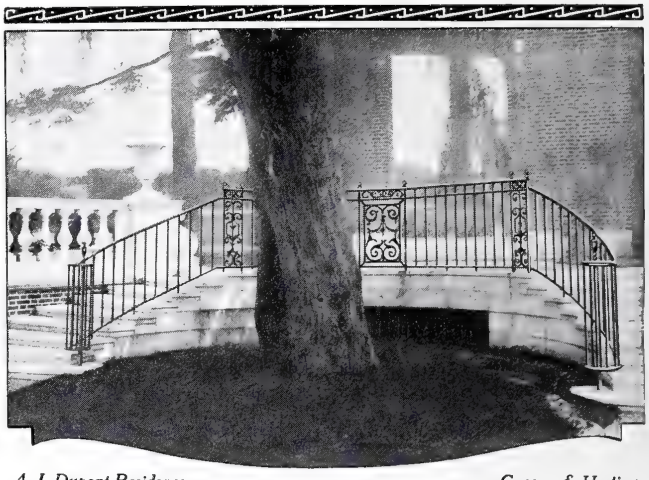
Federal Reserve Bank Building, Chicago
Federal Reserve Bank Building, Kansas City
Drake Hotel, Chicago
Hanna Building, Cleveland
Cunard Building, New York City
Commodore Hotel, New York City

Full information with details of construction will be furnished architects upon request

The Compound and Pyrono Door Co.

Factory and General Offices
St. Joseph - Michigan

Representatives in All Principal Cities



A. I. Dupont Residence
Roslyn, Long Island

Carrere & Hastings
Architects

Why Architects Can Depend on Fiske

ARCHITECTS — yes, and builders, too — have learned by long experience that when they want ornamental metal work of whatever kind done superbly well, it is safer to turn to Fiske.

One example of Fiske lamp posts. Send for catalog.

A Fiske ornamental grille. Many other designs. Send for catalog.

They know that faithful execution of instructions, from either rough suggestions or finished designs, is a cardinal principle with Fiske, that is never violated.

Fiske produces every sort of ornamental metal work in iron, brass, or bronze, elaborate or simple,— fences, railings, grilles, gates, lamp posts, fountains, memorials, etc.

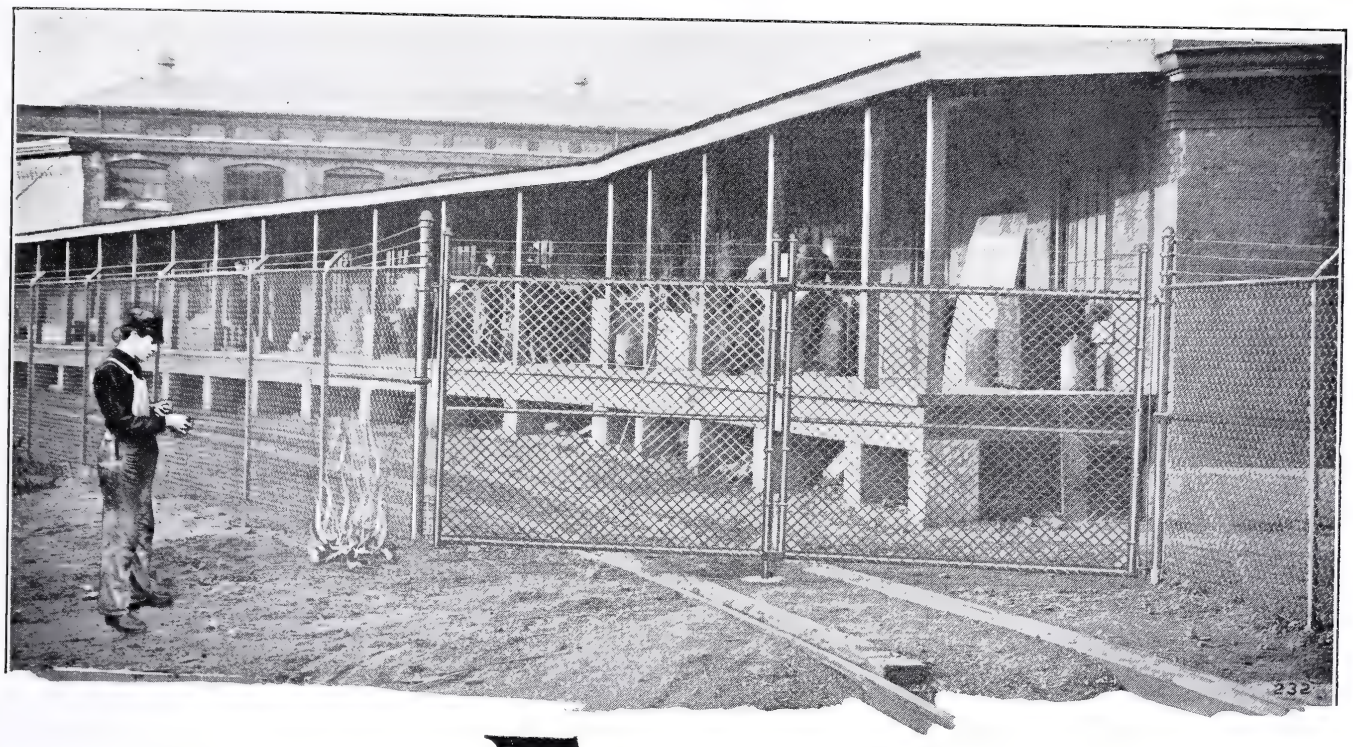
Also, other kinds of metal work, — woven wire fences, fire escapes, spiral stairs, gratings, etc.

More than sixty years' experience is back of all Fiske work.

Fiske will contract to do the installation work, or will furnish plans and blueprints, together with complete erecting instructions.

Send for Fiske Catalog 311.

J.W.Fiske IRON WORKS
ORNAMENTAL IRON WORK
80 Park Place ~ New York
ESTABLISHED 1858



Fence Is Part of the Plant

No. 5—It decreases the hazard of fire to buildings and stored materials, from the carelessness of the "passer-by," and the evil intent of the trespasser and the firebug, and makes the storage of materials safe both in and out-of-doors. In some instances it has effected reduced insurance rates. Ask your Broker.

The above installation typifies the permanent protection, afforded by an Afco Fence and Gates, against deliberate or accidental danger of fire from without. Here, thousands of dollars' worth of petroleum products can be stored on the loading platform without overnight hazard or need of constant watching. This Barrier of Steel has reinforced the company's watchmen and fire brigade to a point where the former fire hazard has been cut in two. It has eliminated the danger from outside sources, always the most difficult to control.

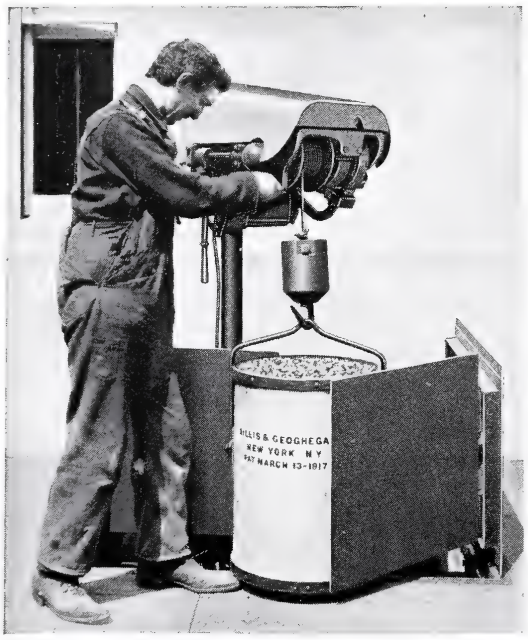
To provide storage space,
reduce fire hazard,
prevent theft,
control traffic and
eliminate trouble,

protective fence is an essential part of the plant.

We shall be glad to have our Fence Engineers consult and advise with you
Factory Fence Catalog No. 21A will interest you

American Fence Construction Company
130 West 34th Street
New York

Barriers of Steel
Afco Fences



Raises Filled Cans Electrically
Lowers Empty Cans by Gravity
WITH MAXIMUM SAFETY

THIS G&G Model E Electric Telescopic Hoist saves time and labor. Its economy in operation over less efficient methods for ash removal is important — but even more important than operating economy is its operating safety.

Note how the sidewalk opening is enclosed. The doors are automatically locked in position and cannot be closed except by operator when he is lowering hoist after work is completed. The spring guard gate through which the can is passing, swings shut after can has cleared it. Not only are passers-by protected against stumbling into the opening, but the operator is likewise protected.

This special protection is available with all models of the G&G Hoist. When ordering, just be sure to say, "With Complete Equipment." Such equipment includes:

Hoist, Sidewalk Doors, Spring Guard Gates, Automatic Door Opening and Closing Device, Operator's Iron Ladder, Electric Warning Bell, Swing Bail Ash Cans, Ash Can Truck.

Specifications in Sweet's and American Architect Specification Manual

GILLIS & GEOGHEGAN
544 West Broadway - New York

The G&G ELECTRIC REG. U.S. PAT. OFF.
Telescopic Hoist
With Automatic Stop and Gravity Lowering Device

Open Sesame
Varnum Door Engine

See our Catalogue in SWEET'S

Showing installation of swinging type of Varnum Engines — cover plate removed.

VARNUM Door Engines are now used by all but one of the Los Angeles Banks. They are used for the opening, closing and locking of grille doors and gates of safety deposit vaults. They operate silently and surely upon the momentary depression of an electric button. They add considerably to banking service and assure greater safety.

Varnum Door Engines are also in use on the Gateways of Country Estates and the Garage Doors of City Homes. Their utility is inestimable. Send for the Varnum Catalogue and blue prints.

VARNUM DOOR ENGINE CO.
949 West 16th Street Los Angeles, Calif.

Stewarts IRON FENCE
STANDARD OF THE WORLD

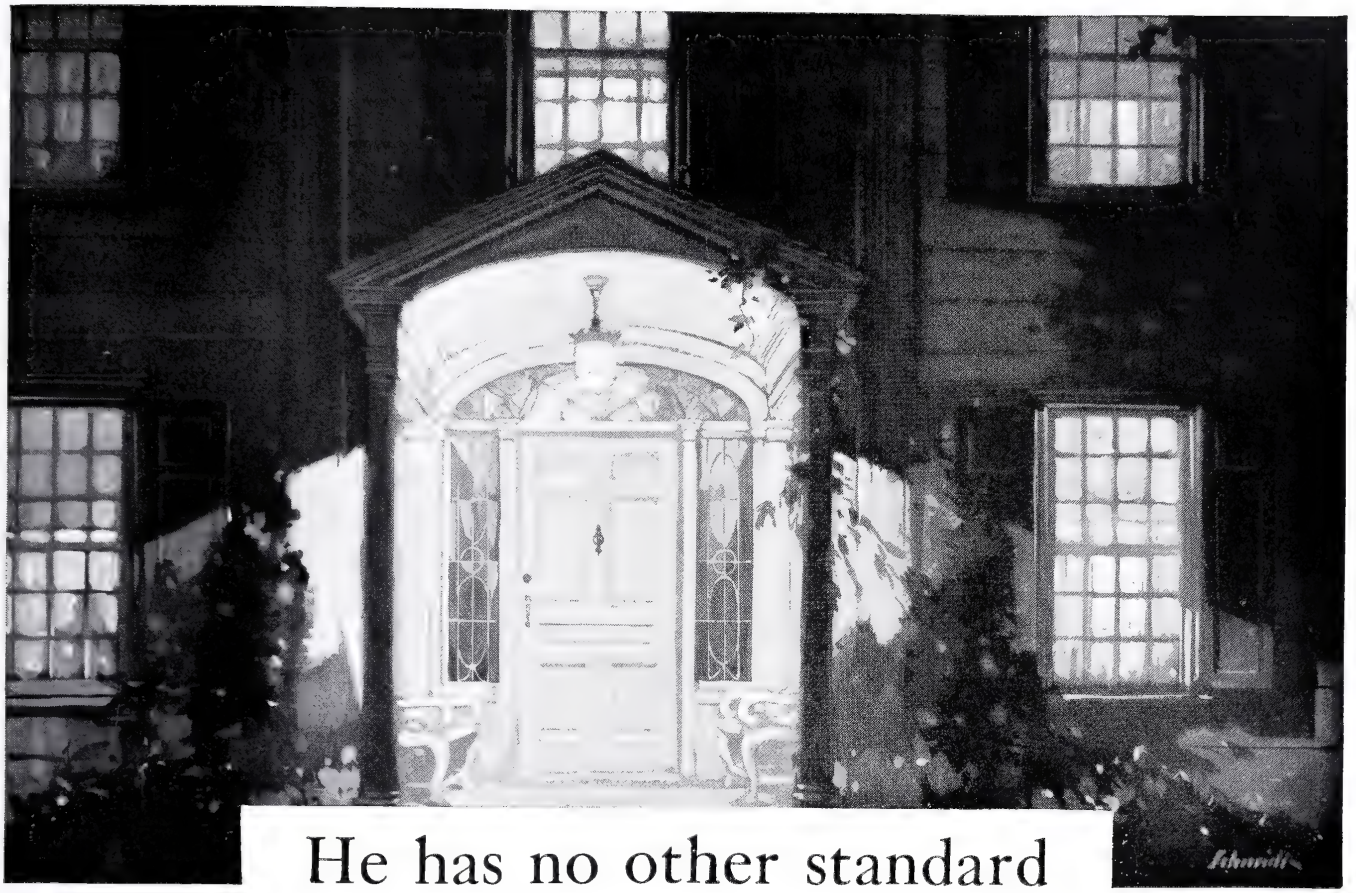
Our distinctive designs harmonize with the lines of the building, whether it is a town house, suburban home, country estate, bungalow or other property.

Book of Designs "B" sent upon request

We also manufacture grilles, balconies, partition railings, folding gates and miscellaneous iron and wire work.

Architects' Designs carefully executed in strict accordance with their specifications

THE STEWART IRON WORKS COMPANY
INCORPORATED
CINCINNATI, OHIO. U.S.A.
"The World's Greatest Iron Fence Builders"



He has no other standard

The city man who builds a country home remote from central power station service still wants light of city brilliance and steadiness, and lots of it. He expects to use all the familiar city appliances—and more.

He balks at assuming the endless care of costly storage batteries. In short, he asks for the nearest possible approach to the only standard he knows—the simple convenience of city electricity.

Fortunately for him and for the architect with the problem of designing the country home with all city comforts, there is the Kohler Automatic. It delivers 110 volt current (city standard) direct from the generator—not through storage batteries. Its full 1500 watt capacity (2 electrical horsepower) is always ready. It starts and stops automatically. It is quiet, economical, easy to care for.

Let us tell you why the Kohler Automatic is so singularly well adapted for country estate and similar installations. May we send you our booklet?

KOHLER OF KOHLER

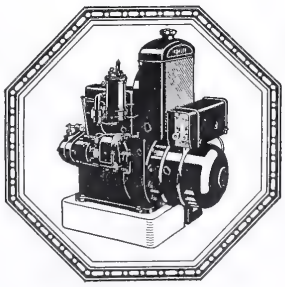
Kohler Co., *Founded 1873*, Kohler, Wis. *Shipping Point*, Sheboygan, Wis.

Atlanta	Detroit	Minneapolis	Omaha	San Francisco
Boston	Houston	Norfolk	Philadelphia	Seattle
Chicago	Indianapolis	New York	Pittsburgh	London
McCormick Bldg.	Kansas City	20 W. 46th St.	St. Louis	

MANUFACTURERS OF KOHLER ENAMELED PLUMBING WARE

KOHLER AUTOMATIC POWER & LIGHT

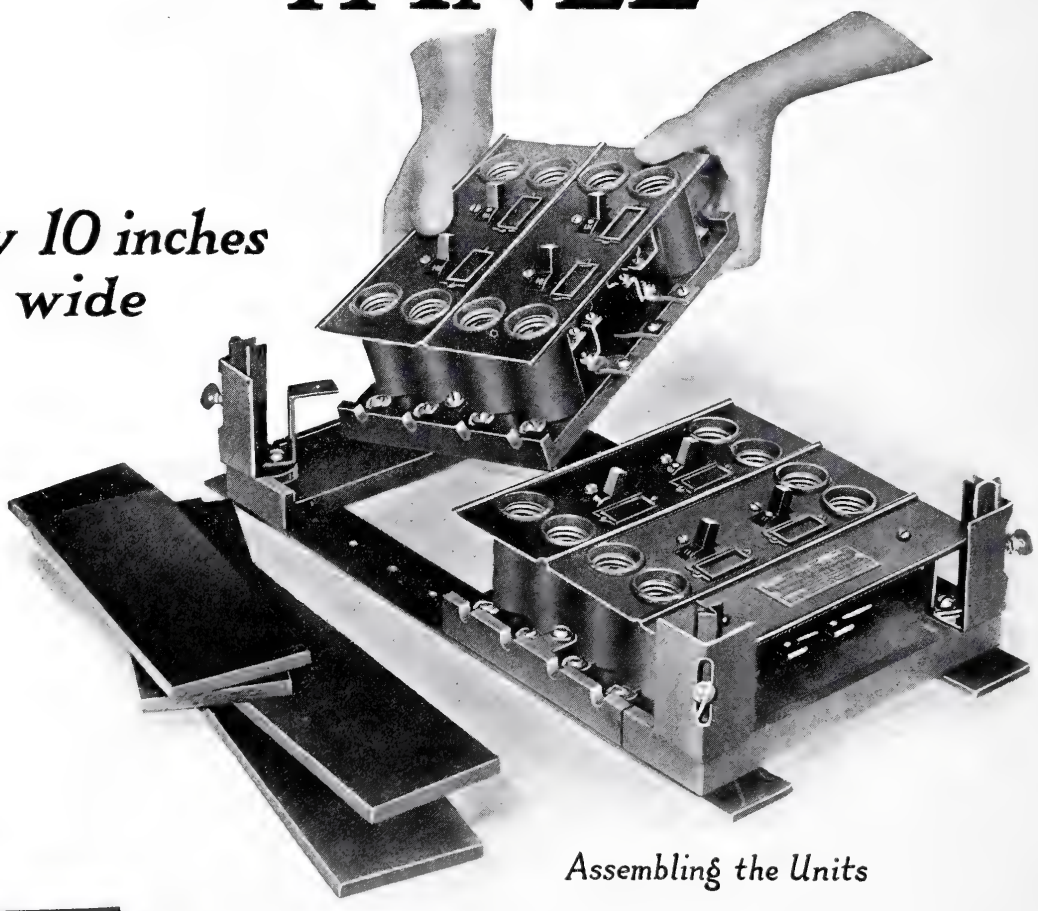
110 VOLT



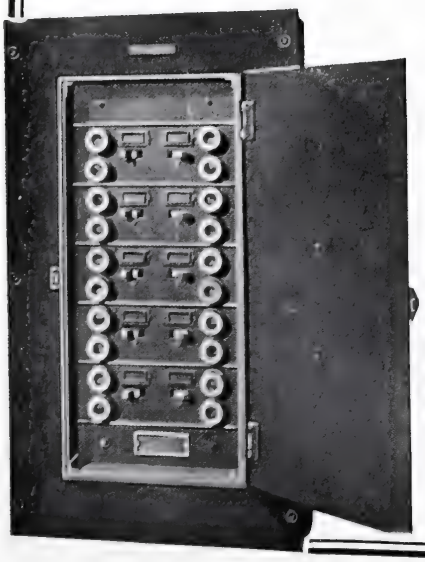
D. C.

THE NEW SPRAGUE *NARROW-UNIT* PANEL

Only 10 inches wide



Assembling the Units



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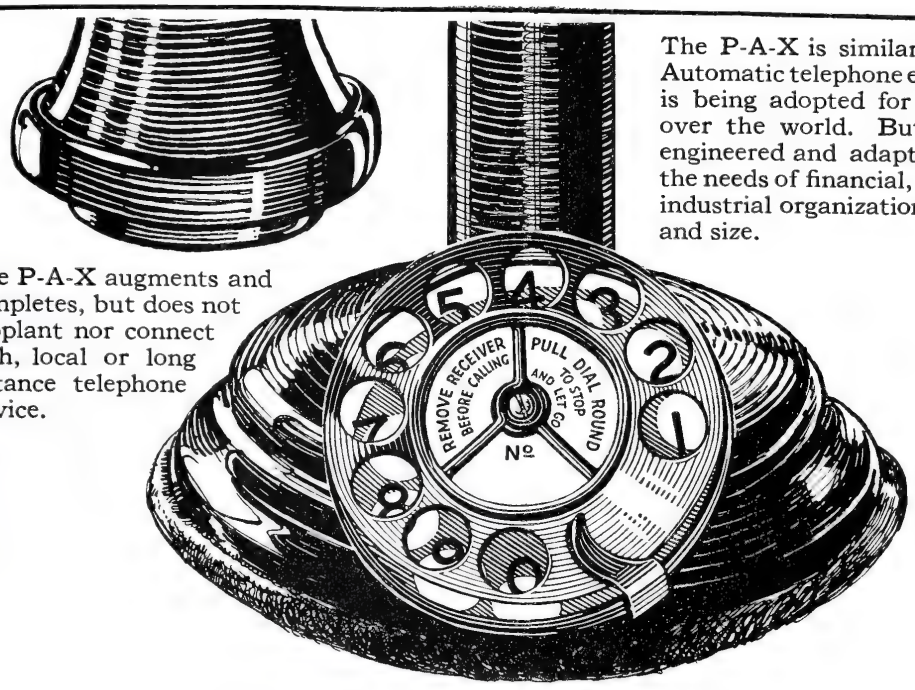

The P-A-X augments and completes, but does not supplant nor connect with, local or long distance telephone service.

The P-A-X is similar to the famous Automatic telephone equipment which is being adopted for city service all over the world. But the P-A-X is engineered and adapted especially to the needs of financial, commercial and industrial organizations of every type and size.

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WE both have a great deal at stake whenever you specify the P-A-X. You have your good name and reputation—so have we. You are responsible to your client — *we* are responsible to *you and your client*.

In initial cost the P-A-X might not be the lowest. But when you specify the P-A-X, your client gets all he pays for—and more. It not only fulfills his immediate inter-communicating requirements—but it meets all possible electrical signaling needs as changing conditions demand them.

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We will be glad to supply you with detailed information for your immediate or future reference. Write or telephone our nearest office.

Automatic Electric Company

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More than a private telephone exchange—the Automatic Electric Services of the P-A-X include and co-ordinate interior telephony, code call, conference, watchman service and all other inter-communication needs

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Signaling and Protective Systems

For Hospitals, Industrial Buildings, Hotels, Schools, Factories, etc.

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The Holtzer-Cabot Electric Company specialize in the manufacture of "Hospital Signal" and fire alarm systems suitable for all classes of service.

Each system is designed especially for the type of building and the particular service for which it is required.

Holtzer-Cabot installations have been developed and perfected and contain many absolutely exclusive features.

They are simple, safe and reliable.

Architects and engineers are invited to write for brochures published in their interest, "Hospital Signal Systems" and "Signaling Systems for Schools"

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Safe to Specify Safe to Buy

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The new Triumph Type "R" Safety Type Residence Panel Board is destined to find its way into hundreds of homes. The architect's technical knowledge will reveal to him the practicability and economy of "R" Type sectional unit construction and convince him that it is safe to specify.

The home-builder learning of the absolute safety of the "R" Type that makes its location on the first or second floor at the center of distribution possible, where even the woman of the house can replace fuses, will feel that it is safe to buy.

Write today for the "R" Type Bulletin containing complete details and architects' specifications. It is a valuable addition to any architect's library.

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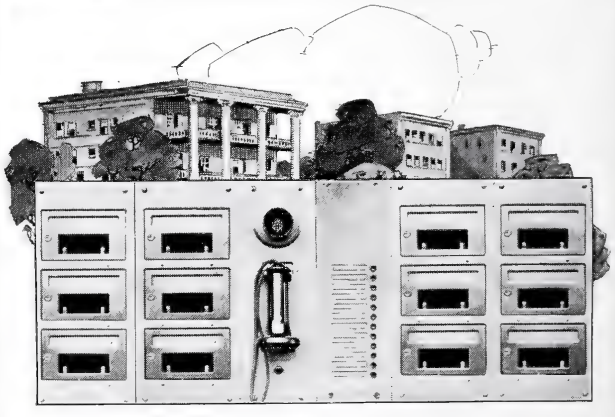
Other "F-A" Products
Major System of Theater Lighting Control; cabinets; knife switches; safety switches; hanger outlets; reversible-cover floor boxes; A. C. and D. C. Distribution Switchboards.



Stromberg-Carlson Apartment House Telephones

SYSTEM NO. 5A
A simple system for small apartment houses. One way telephone service from vestibule to apartments and door opener service from all apartments to vestibule.

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An elaboration of the above, for apartments where janitor is always in attendance. Vestibule telephone calls any apartment or janitor. Janitor may also be called from any apartment. Electric door opener service

Other systems for apartment dwellings of all sizes and types. Write for Bulletin No. 15 giving further information.

Stromberg-Carlson Telephone Mfg. Co.
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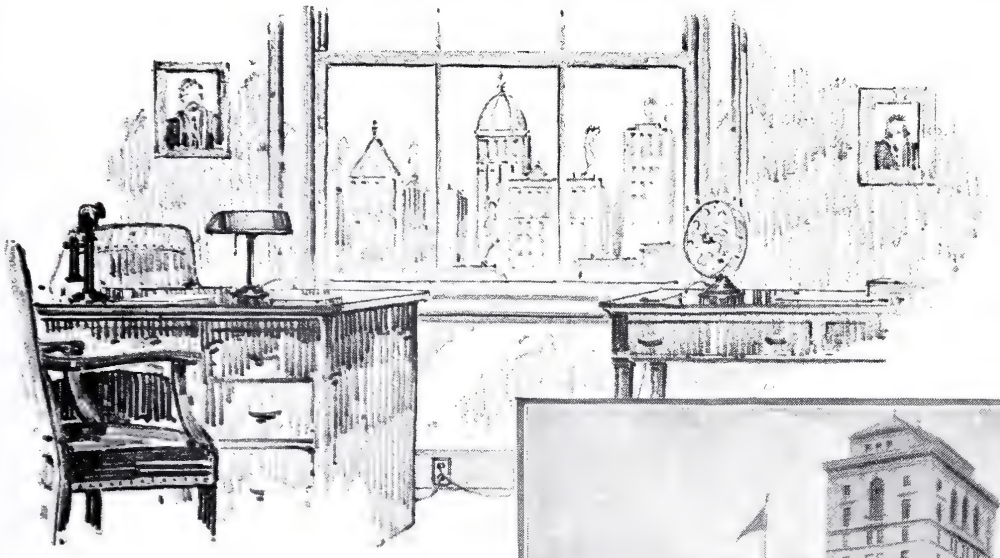
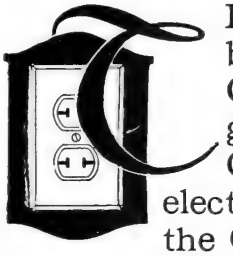


Convenience and Business Efficiency

John Hancock Insurance Co. Building, Boston, Mass.—equipped with G-E Tumbler Switches. Parker, Thomas and Rice, architects. French and Hubbard, consulting engineers.



THE added convenience afforded by the G-E "Standard" Twin Convenience Outlet makes for greater efficiency in any office. Considering the growing use of electrically driven office equipment, the G-E Twin Convenience Outlet should be used wherever an outlet is desired. The double duty which every outlet will be called upon to perform sooner or later, amply justifies the original installation of this modern device, particularly since the cost is practically no more than that of a single outlet.

Thoroughly representative of G-E quality, the Twin Convenience Outlet is mechanically and electrically correct.

G-E RELIABLE WIRING DEVICES

can be furnished by any qualified electrical contractor or address Merchandise Dept., General Electric Co., Bridgeport, Conn.

G-E. National Advertising to prospective home builders is creating a new appreciation of the comforts of a completely wired home—stimulating desire for added refinements.

General Electric Company

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41-201

Cash in on the "Nuisance Value" *of old style plug fuses*

You know how it is to fumble around in a cutout box full of plug fuses

—and squint vainly at the fusible strip showing dimly through the mica "windows"

—and get yourself shocked and your fingers jammed between the flaring metal tops

—while you unscrew every plug in the box

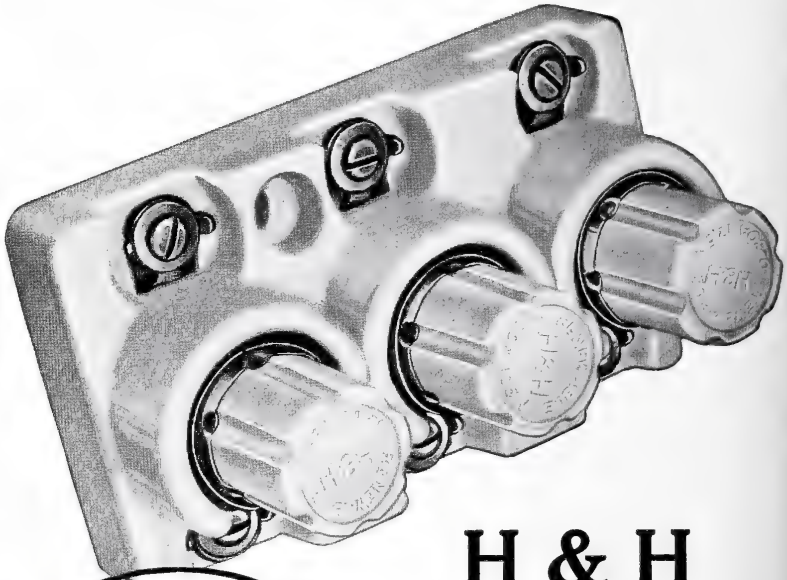
—and finally have to test them all

—and then discover that the blown fuse is the first one you touched.

* * *

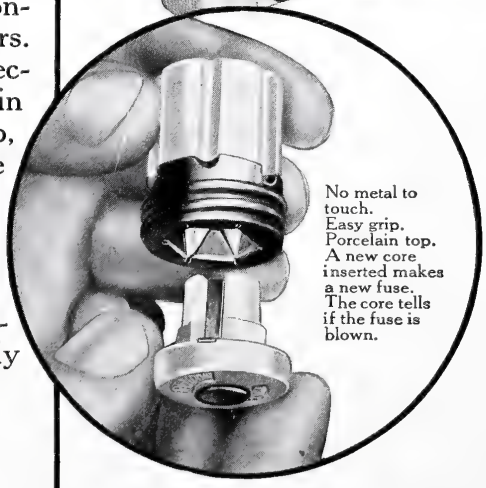
You know how it is

And you know how easy it would be to sell a really good fuse plug that would end this nuisance. That's why you should start in *now* to cash in on the "nuisance value" of the old style fuse plugs, by stocking the



Paiste Wiring Material

Paiste Wiring Material affords a complete service to current consumers, electrical dealers and contractors, architects and builders. Every wiring requirement for electrical convenience and service in the home, office, store or shop, can be perfectly met by a Paiste product. Whether you specify, recommend, sell or install wiring material for client or customer, or purchase for your own account, you may be sure that Paiste Service and Quality will perfectly protect your interests.



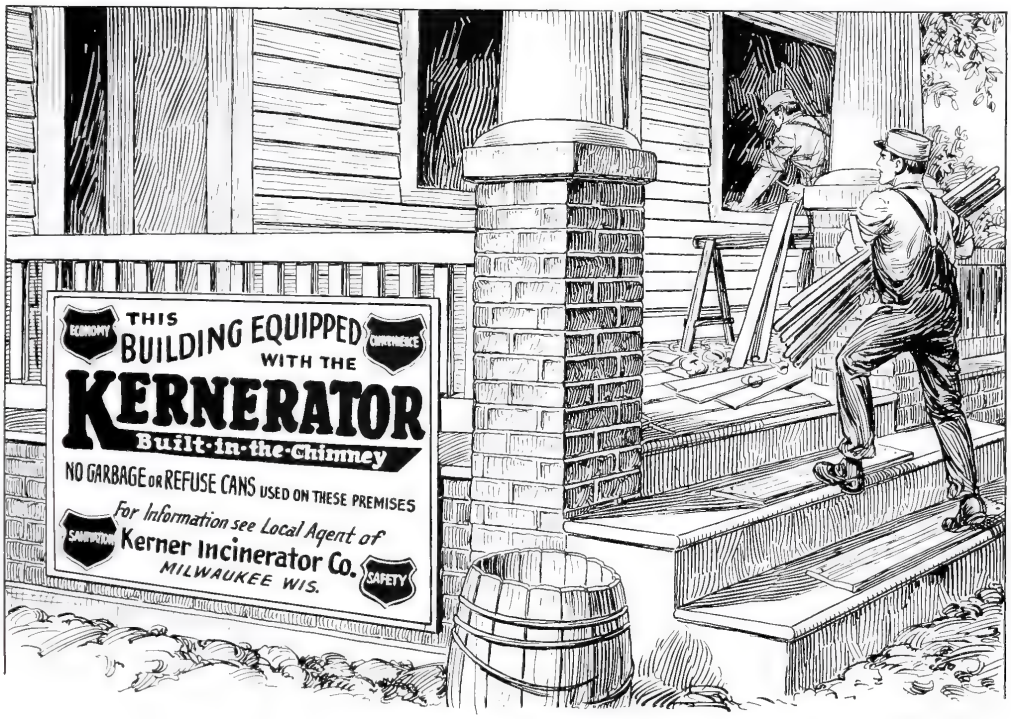
H & H FUSE PLUG

When an H&H blows
It's easy to tell—
That's one reason why
They're so easy to sell.

Another reason is their straight, porcelain tops. No metal for users to fear. Plenty of room between the plugs; gives a good grip; makes it easy for the user to screw them in and out of sockets. And they're refillable. To refill, just unscrew the plug, pull out core, and insert new core.

Write for details and prices

The Hart & Hegeman Mfg. Co., Hartford Conn.



A Sign of Foresight

HOW frequently one sees this Kernerator sign on fine residences and apartment buildings now under construction! This sign tells the story of Kernerator success, its nation-wide acceptance by builders and home-owners. But more than this it shows the thoughtfulness of a growing number of architects who have come to appreciate the value of the Kernerator in the home.

Many architects consider this modern system for disposing of household waste as essential to comfort and convenience as first-class plumbing or an efficient heating plant. They appreciate how the Kernerator saves steps, how it eliminates the health menace of the insanitary garbage can, how it reduces the fire hazard by making unnecessary the accumulation of refuse.

The Kernerator is of simple construction, yet it lasts as long as the building in which it is installed, with *no expense* for repairs or upkeep. It consists of a brick incinerator, built into the base of the chimney when erected, and hopper doors in the flue on the floors above. It disposes of all household waste *without cost* because the refuse itself is the only fuel required. Every few months the ashes and non-combustibles are removed from the ash-pit.

For complete information, see page 2124, Sweet's 1922 Catalog

KERNER INCINERATOR CO.

1015 Chestnut Street - Milwaukee, Wis.

KERNERATOR
Built-in-the-Chimney

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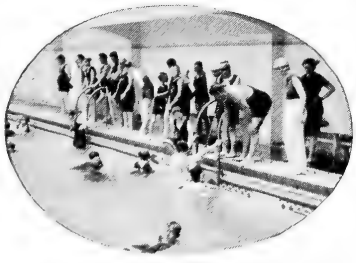
JSC

The word *service* in this company's name applies to the installation of the Johnson Pneumatic System of Temperature Regulation by no one other than the Johnson Service Company. It implies the efficient performance of the apparatus following installation. It includes the company's guarantee of attentive interest in the installed apparatus as long as it exists. It embraces the superior benefits derived from The Johnson System, in its various applications: alone unequally advantageous, and especially so with the foregoing comprehensive elements of strict supervision. *Service*, indeed.



Seattle, Washington, Natatorium, where W & T apparatus is keeping the water pure

Pure Water *for* Swimming Pools

Sanitation is the most important phase of swimming pool operation and design.

The most elaborate pool is a failure if it is allowed to become a breeding place for disease germs.

The W&T Process of chlorination is used by nearly two hundred pools in the United States. It is the standard equipment for swimming pool sterilization.

W&T Equipment also sterilizes over four billion gallons of drinking water every day.

Our booklet, "Pure Water for Swimming Pools" will be sent to any address on request.

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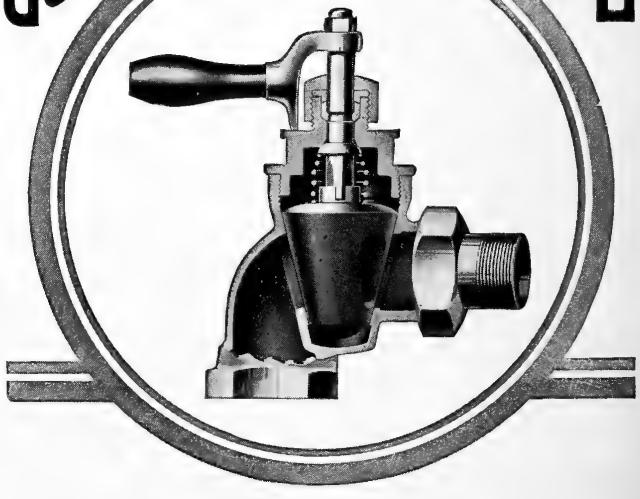
GORTON QUARTER TURN VALVE



A Quarter Turn of the Wrist Opens or Closes this Valve

A Packing Lock Stem, with Ground Shoulder seating in bonnet, insures a Tight Valve that Stays Tight.
Send for Catalogue showing why

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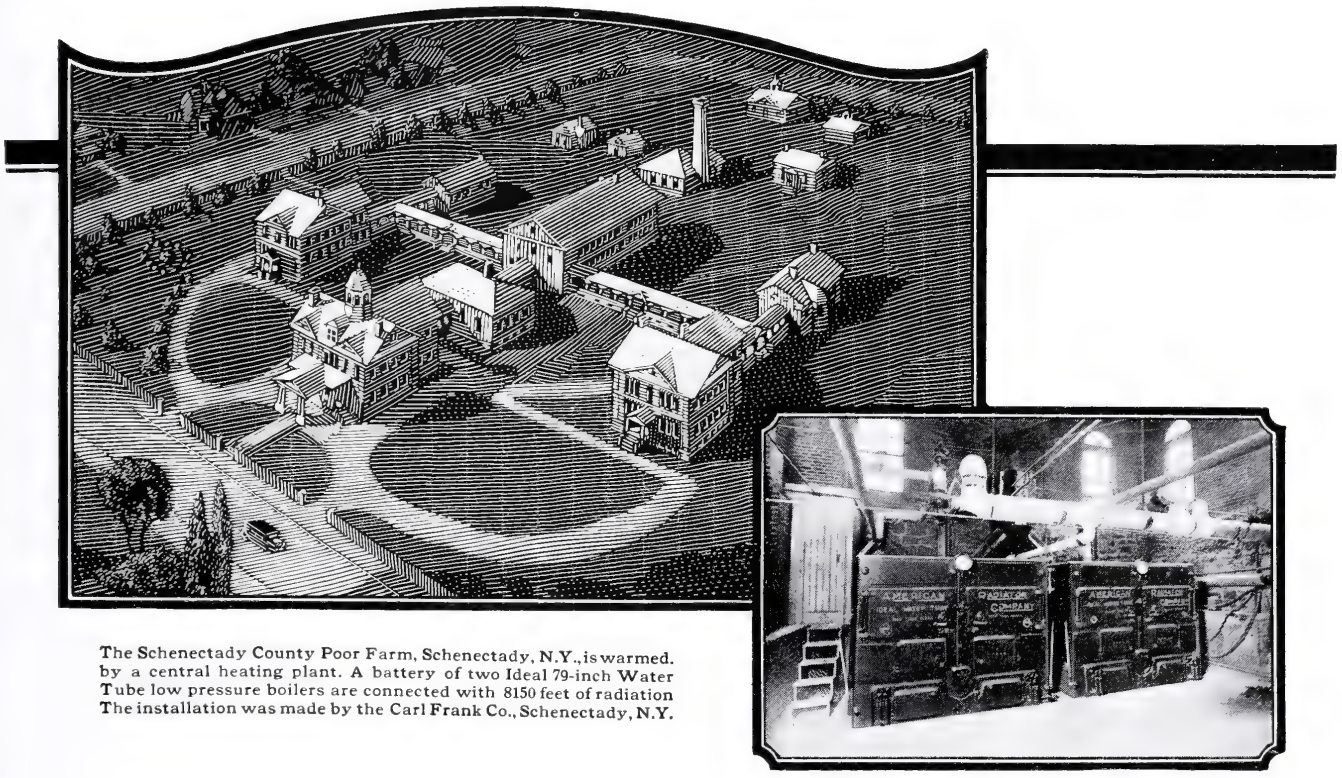
Fisher Building, Chicago, Illinois



The Schenectady County Poor Farm, Schenectady, N.Y., is warmed by a central heating plant. A battery of two Ideal 79-inch Water Tube low pressure boilers are connected with 8150 feet of radiation The installation was made by the Carl Frank Co., Schenectady, N.Y.

Poor in pocket—Rich in warmth

THOUGH poor in pocket the tenants of the Schenectady County Poor Farm, Schenectady, N.Y., now enjoy better warmth than the owners of too many first-class homes.

And the County, last Winter, saved 50 tons of coal!

The Poor Farm consists of several buildings, distributed over a city block, and warmed from a central heating plant.

Though the old heating plant carried a constant load of from eight to ten pounds of steam, it failed to deliver adequate warmth. So the old boilers were replaced by two IDEAL 79" Low Pressure Boilers.

This is what the superintendent, Mr. Chisholm wrote at the end of the winter:

We are gratified with the change to the IDEAL 79" Boilers. Instead of carrying eight to ten pounds of steam, the entire system of 8150 feet of radiation now warms quickly on three to four pounds. And from November to April we have saved easily fifty tons of coal.

IDEAL 79" Water Tube Boilers have many new and interesting points of construction; every Architect or Heating Engineer interested in adequate heating equipment, for apartments, schools, hospitals, hotels, theatres, banks or office buildings, should have the booklet describing them.

Your name on your letterhead will bring it at once.

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IDEAL Boilers and AMERICAN Radiators for every heating need

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AMERICAN RADIATORS IDEAL BOILERS

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This Book Will Tell You *about* Dunham Heating Service

New Edition No. 214, just off the press

—and in addition, give you heating facts arranged in concrete form for quick reference. Here are a few of the subjects discussed in the Dunham Hand Book.

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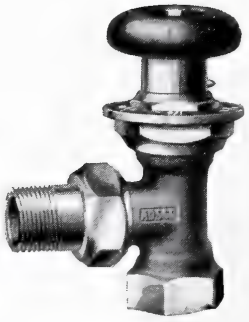
REG TRADE-MARK
HEATING SERVICE

You can Save more Steam— Fuel— Money with the Packless Adsco Graduated Radiator Valve



Closest graduation.
Full nickel plated.
Plain nickel letters on black dial.
Non-rising stem; always free-moving; always steam-tight.
Removable insert—valve fits any size radiator 20 to 200 sq. ft.
Sold to heating contractors on merchandise basis at uniform price.
Write for special folder.

Ask about Adsco Heating of building groups from Central Station Steam Plant, Bulletin No. 20-AF; for individual buildings, Bulletin No. 158-AF.

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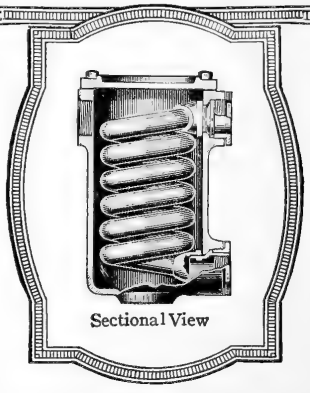

Sectional View

Send for Free Booklet!

Tells how to have abundant hot water, without gas bills, during the heating season

Steady advertising in *Saturday Evening Post, American Magazine* and *Good Housekeeping Magazine* is stimulating wide-spread interest in Excelso Method of Heating Water. Are you fully posted on advantages of this method, whereby "Water Heats Water"?

Excelso Method is adaptable to any heating plant. Send *today* for free booklet.

See our Catalog in Sweet's

EXCELSO SPECIALTY WORKS, 204 Excelso Bldg., Buffalo, N. Y.

EXCELSO WATER HEATERS

Sold by All Plumbers and Steamfitters

Residence of Mr. Edward Bok, Merion, Pa.

Kelsey Health Heat

THE residence of Mr. Edward Bok, at Merion, Pa., is heated by two Kelsey Warm Air Generators. The fact that this large residence can be thoroughly heated by two of them is evidence of their unusual adaptability for homes of this class.

One of the most valuable features of the Kelsey is its system of circulation and ventilation. The warm air is delivered in large volumes at a velocity which insures constant circulation, while the used air is drawn off through vents at the floor line. The automatic humidifier supplies a normal amount of moisture to the air, preventing the dryness which causes furniture and floors to shrink. This combination of warm, humidified air, perfect circulation and ventilation, provides a heating system which promotes good health. Its cost of operation is phenomenally low, due to its scientific design and heavy, durable construction.

The Kelsey system has also just been installed in Mr. Bok's winter home at Mountain Lake, Florida, E. M. Parsons & Company, architects, Boston, Massachusetts.

Our Engineering Department offers the architect its fullest cooperation, furnishing detailed plans and specifications. Write for "Kelsey Achievements," and any other heating information you desire

NEW YORK OFFICE
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(Corner 46th Street)

THE KELSEY
WARM AIR GENERATOR
(Trade Mark Registered)
251 James Street, Syracuse, N. Y.

BOSTON (9) OFFICE
405–F P. O. Sq. Bldg.

A-2184

Trade Mark KELSEY HEALTH HEAT Registered

THERE ARE MANY REASONS "WHY" THE

HUMPHREY
AUTOMATIC GAS WATER HEATER

SHOULD BE INCLUDED IN YOUR PLANS AND SPECIFICATIONS

They provide the easiest, cheapest and most convenient means of securing HOT WATER.

There is no requirement that cannot be met with a HUMPHREY AUTOMATIC GAS WATER HEATER, large or small.

They are QUALITY BUILT, giving service that is lasting and cheap, and have earned their HIGH REPUTATION.

They are universally known as SUPREME in value, durability and dependability.

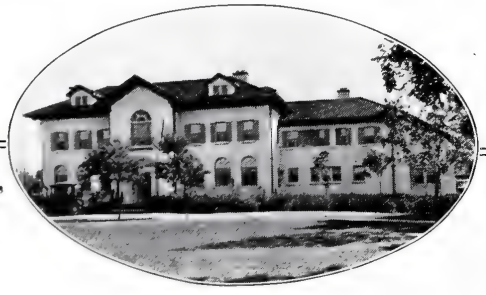
They are an ABSOLUTE NECESSITY to cleanliness, health and comfort.

The Humphrey Architects' Manual

with Service Specifications contains all the information on the subject of HEAT WATER WITH GAS, such as: the proper size and type heater for any need; the capacity of all types and sizes; number of gallons per minute each type delivers at various temperatures.

It is a reference and text book that should be at your finger tips at all times. If you did not receive a copy, write for it. IT IS FREE.

HUMPHREY COMPANY - - - KALAMAZOO, MICHIGAN
Div. Ruud Mfg. Co.



Home of
Frank H. Woods
Lincoln, Neb.
Paul Hyland
Architect
Chicago, Ill.

Be Prepared

YOU can easily write specifications for an electric light, water supply or sewage disposal system if you have our 46-page bulletin entitled "Specifications" in your files. It gives you full information and data regarding the 150 styles and sizes of Kewanee Light and Water Supply Systems and simplified instructions for selecting the proper one for your client no matter what his requirements. Your copy of "Specifications" is waiting. Send for it today.

KEWANEE
PRIVATE UTILITIES COMPANY
442 S. Franklin Street Kewanee, Illinois

THE CUTLER MAIL CHUTE

Reduced costs and increased volume of business enable us to maintain our high standard of quality at a material reduction in price.

Specify Model F. standard equipment.

CUTLER MAIL CHUTE CO.
OFFICES AND FACTORY
ROCHESTER, N. Y.

And in Grand Rapids!

STEP from the street into the Empress Theatre during a hot, sultry day—immediately you become aware of the cool, refreshing atmosphere. Go to this theatre on winter's coldest night and you will find it comfortably warm—and the air clean and pure.

A well designed, perfectly operating ventilating system is the assurance of ideal air conditions in the Empress, both in winter and in summer.

Some little credit for this continuous supply of fresh, pure air justly belongs to the two Clarage Fans, which have given exceptionally good service for seven years. Not once since their installation have these fans required repairs. Not once have they demanded attention, except an occasional oiling.

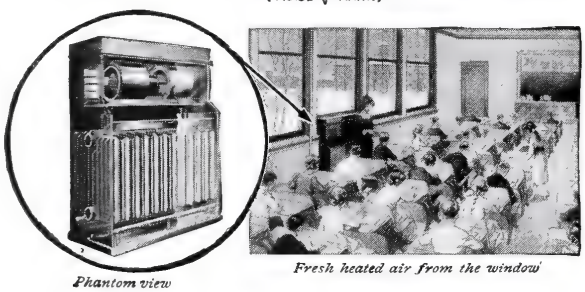
Records like this have caused a great number of the leading architects to specify Clarage Kalamazoo Multiblade Fans. Are you familiar with the Multiblade Fans? Let us send you catalog No. 52.

CLARAGE FAN COMPANY, Kalamazoo, Michigan
BRANCH OFFICES IN ALL PRINCIPAL CITIES

CLARAGE — KALAMAZOO Multiblade Fans

UNIVENT

"LIVE OUTDOORS-INDOORS"
(TRADE MARK)



Phantom view *Fresh heated air from the window*

What the Jamestown and other school boards found out about the Univent

In 1914 the Board of Education of Jamestown, New York, made a thorough study of ventilating systems. As a result they approved and accepted the Univent idea for ventilating a school.

They did this because the Univent permitted each and every room to be ventilated independently of any other room. Instead of a system of long, uncleanable ducts and flues, each Univent took fresh air directly from outdoors, heated it, and thoroughly diffused it throughout the rooms.

This was their ideal of perfect ventilation—as simple and more positive than opening the windows—but without cold, dangerous drafts.

They found the absence of ducts saved space, lowered building costs and assured each room of its own individual supply of fresh air. When only one room was being used, only the Univent in that room was used. This saved operating cost. So, in 1920, when a big school building program was decided upon, the Jamestown School Board installed the Univent system in five more large schools.

In 1913, Utica, New York, tried out the Univent. Today nine schools in Utica are Univentilated.

School authorities, everywhere, from NewYork to California say the Univent makes class room air as fresh as outdoors. This perfect ventilation increases mental alertness and decreases sick leave.

The Univent is designed for schools and all buildings requiring mechanical ventilation; it may be installed in old or new buildings.

Having determined upon a Univent system the Architect can prepare his preliminary sketches without further thought to heating and ventilating, knowing that he will not have to tear down his building to install it, or be handicapped in meeting his estimate cost by addition of space or expensive construction.

Send for a copy of our 72-page Architects' and Engineers' edition "Univent Ventilation" or, better still if you have a ventilation problem, send us sketches or blue prints and let us make specific recommendations and estimate of cost. No obligation.

THE HERMAN NELSON CORPORATION
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NO. 6 SCHOOL, JAMESTOWN, N. Y.
HAS COMPLETE UNIVENT INSTALLATION
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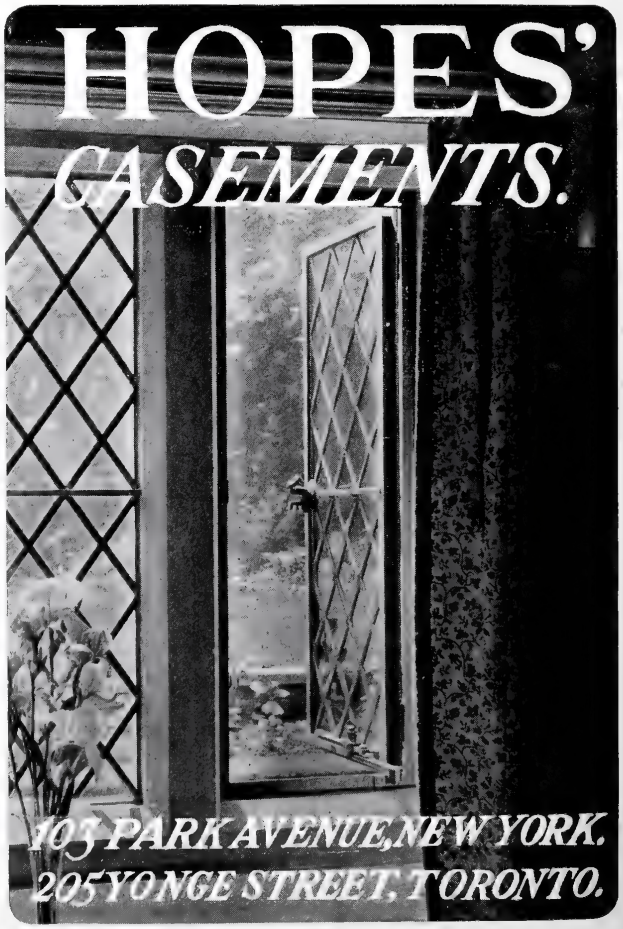

RESIDENCE OF A. R. ERSKINE, ESQ., SOUTH BEND, IND.

AUSTIN & SHAMBLEAU, Architects TWO W-408 SUPER-SMOKELESS BOILERS L. H. PRENTICE CO., Heating Contractors

For Smokeless *and* Low-Cost Heating *of* Fine Residences *equip with*—

UTICA-IMPERIAL

SUPER-SMOKELESS BOILERS

MANY large Residences, Apartments and Hotels are now heated with Utica-Imperial SUPER–SMOKELESS Boilers. These boilers burn the cheapest grades of soft coal without smoke and with remarkable efficiency, making possible substantial economies in the cost of heating all large buildings.

It is the patented application of the Bunsen Burner Principle that makes SUPER–SMOKELESS Boilers so highly efficient and smokeless in operation. At the very heart of the fire, additional oxygen is mixed with the combustible gases, transforming the heavy smoke into intensely hot, clean flames, which swirl forward and back through the boiler, imparting maximum heat units to all the flue surfaces.

Recurring scarcity of fuel need never prevent the operation of SUPER–SMOKELESS Boilers, as they will operate successfully with any type of fuel. Although designed to burn the cheapest grades of soft coal, either hard coal, coke, gas or fuel oil may be used if desired.

A special bulletin devoted to the heating of Residences, Apartments and Hotels will be sent to you upon request

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218-220 W. Kinzie St., CHICAGO 707 Union Bldg., CLEVELAND 5620 Grand Central Term'l, N.Y.

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Another Jenkins Standardization —what it means

Jenkins Valves, and ***Jenkins Only,*** *are installed throughout the new First National Bank Building, Jersey City*

Architect: *Alfred C. Bossom, New York City;* ***Plumbing and Heating Contractors:*** *W. W. Farrier & Co., Jersey City*

Fig. 106, Standard Brass Globe Valve, one of the many types of Jenkins Valves used

There are many and obvious reasons why STANDARDIZATION OF JENKINS is true valve efficiency and economy—the six most distinct are:

(1) An assured valve service—for Jenkins Valves have strength and proportion to meet the most severe conditions.

(2) Operatives can easily acquaint themselves with the simple construction of Jenkins Valves. They do not have to worry about the actions and peculiarities of valves of widely varied manufacture.

(3) Reduced inventories of replacement parts, as it is not necessary to carry a scattered assortment of parts—which is the case where valves of many and various makes are used.

(4) Parts are interchangeable, made so by careful and standardized manufacture. "Veteran" valves can always be supplied with parts that "fit"

(5) Nation-wide distribution, through supply houses everywhere, carries Jenkins Valves and their parts to every locality.

(6) Money is saved, for Jenkins Valves go into service and stay—a quality which, alone, would make them the most economical.

Jenkins service can only be expected from genuine Jenkins Valves—specify Jenkins "Diamond Mark" Valves, and avoid imitations.

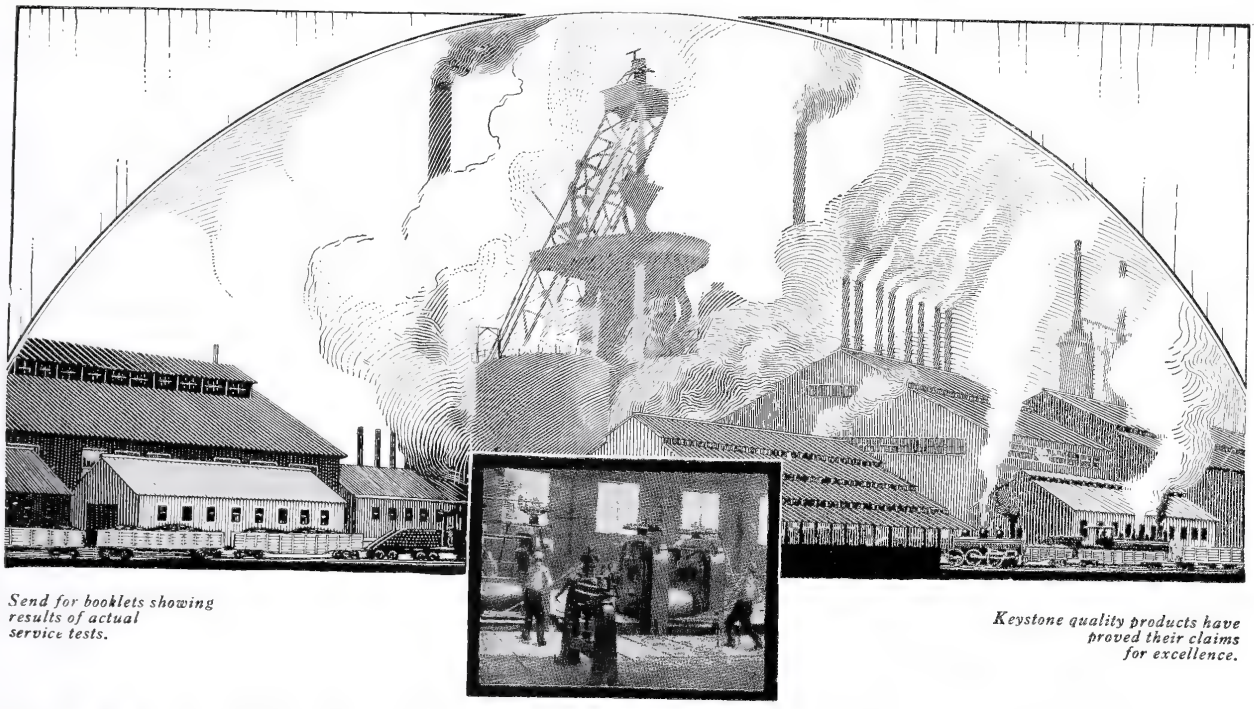
JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London

FACTORIES: Bridgeport, Conn.; Elizabeth, N. J.; Montreal, Can.

Jenkins Valves
SINCE 1864

KEYSTONE COPPER STEEL



Send for booklets showing results of actual service tests.

Keystone quality products have proved their claims for excellence.

SEVERE Service Conditions

demand better material. The metal which goes into the roofing, siding, and structures of great steel mills and industrial plants, must *resist rust* to the highest possible degree. Keystone Copper Steel Sheets and Roofing Tin Plates give *maximum service and rust-resistance* not only for industrial uses, but for residences, public buildings, and all forms of construction work to which sheet metal is adapted.

The high reputation of our products is recognized wherever sheet metal is used. Each brand of our manufacture has behind it a service—the scope of which has a tangible value to every architect and builder. This service begins with the planned care and skill in the making, which is carried through to the thorough system of distribution which keeps these products obtainable in every part of the country.

For roofing, siding, gutters, spouting, eaves trough, sheet metal and tin work, use Keystone Copper Steel Galvanized Sheets and Roofing Tin Plates—best for both builder and property owner. Sold by leading metal merchants, and used by leading roofers and contractors.

KEYSTONE COPPER STEEL

Keystone Copper Steel is an alloy made by the addition of a certain percentage of Copper to well made Steel, thereby greatly increasing its lasting and rust-resisting qualities under actual service conditions. It has been scientifically developed and tested—and its use is strictest economy.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES:

Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

Export Representatives: United States Steel Products Company, New York City

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Saving $100.00 For Every $7.00 Invested

The value of rust-resisting pipe like Byers is never better demonstrated than when comparing its extra cost with the saving it effects. For it is not only a question of replacing the pipe itself if it rusts out, but the heavy cost of labor, ruined fittings, and other items in the system. (See diagram).

No pipe system can long survive if made of pipe lacking the required rust-resistance. Pipe is but a small part of the cost of such a system, yet it is the *one* part which is most subject to destruction.

This is so because of the large surfaces of thin metal exposed to continuous corrosive attack. And when destroyed by rust, the pipe pulls the whole system down with it, causing a replacement expense exceeding the cost of the entire first installation.

Byers Bulletin No. 38, "Installation Cost of Pipe," contains cost analyses of a variety of plumbing, heating, power and industrial pipe systems, with notes on corrosive effects in different kinds of service. Send for a copy.

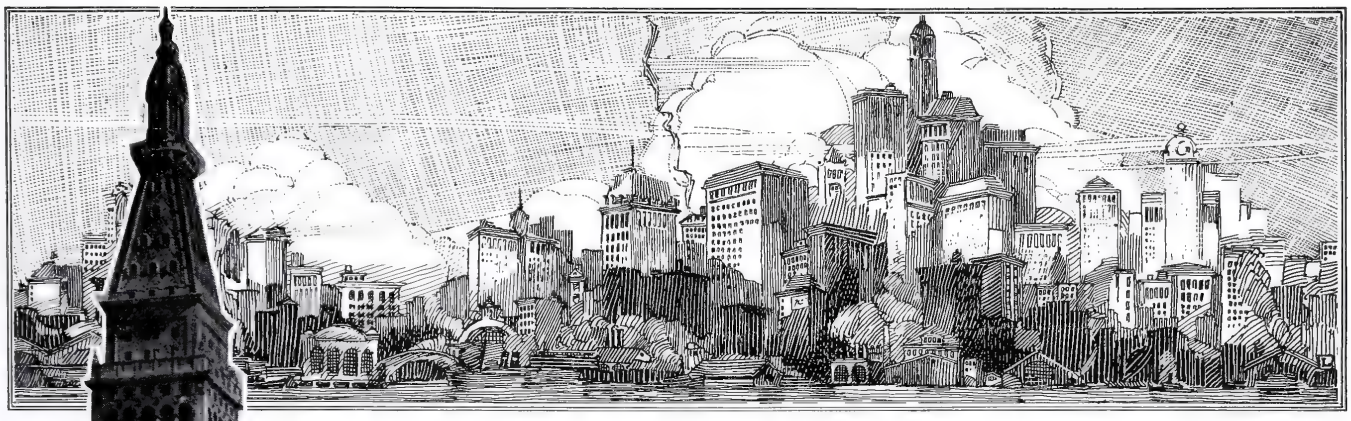
A. M. BYERS CO : PITTSBURGH, PA.
Established 1864

New York Philadelphia Boston Cleveland
Chicago Houston Tulsa Los Angeles

BYERS PIPE

GENUINE WROUGHT IRON

Look for the Name and Year rolled in every length



How the Metropolitan Life Protects its Investments

Home Office, New York City, of Metropolitan Life Insurance Co., Reading Pipe installed.

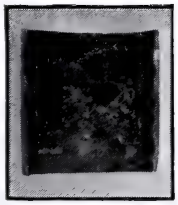
A BIG insurance company such as the Metropolitan is obligated to protect the interests of its policy holders in every possible way. There must be no chance of loss or risk of principal.

While real estate mortgages are properly considered the best of investments, the Metropolitan, through its Real Estate Department, makes its investments in them doubly safe by insisting upon the use of building materials which prolong the life of the building and insure low maintenance costs. Mr. D. Everett Waid, Consulting Architect of the Metropolitan Life Insurance Company, passes upon the plans and specifications before the loan is made and insists upon the use of Genuine Wrought Iron Pipe, as against steel pipe, for all the plumbing lines. You will find millions of feet of Reading Pipe in buildings erected with the aid of funds from the Metropolitan.

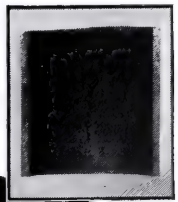
Whether your client's interest lies in a modern skyscraper or in a residence to house his family, the proper pipe for heating and plumbing lines is a matter of serious concern. Good pipe is a protection of his investment—poor pipe, a source of constant trouble and expense.

Reading Genuine Wrought Iron Pipe is the pipe that endures. The best proof of that lasting quality can be found in the large office buildings, hotels, schools and hospitals throughout the country. Here it has been selected because time after time Reading Genuine Wrought Iron Pipe has proven its ability to resist corrosion and serve three times longer than steel pipe. And, since the installation expense is constant, regardless of the kind of pipe used, Reading Pipe should not add over 5 per cent to the pipe bill. Figured in terms of the ultimate cost, Reading Genuine Wrought Iron Pipe is far and away the most economical.

Send for our instructive booklet, "The Ultimate Cost"
It contains much useful pipe information



Below—Reading Genuine Wrought Iron Pipe in service for 22 years.



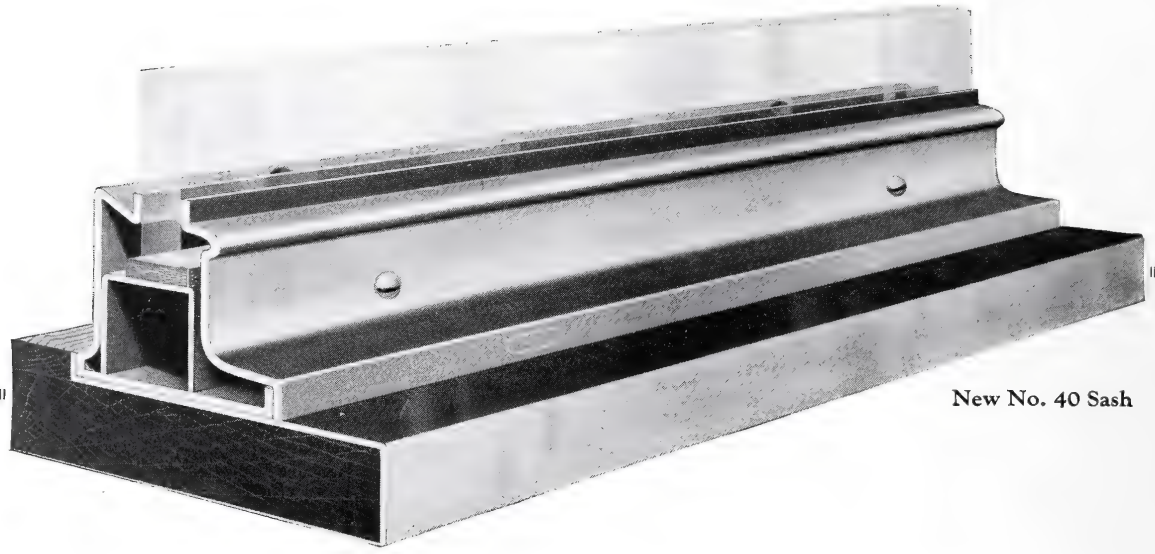
Above—Steel Pipe 8 years in service

READING IRON COMPANY, Reading, Pa.

World's Largest Makers of Genuine Wrought Iron Pipe

BOSTON
NEW YORK
PHILADELPHIA
BALTIMORE
PITTSBURGH
CINCINNATI
CHICAGO
FORT WORTH
LOS ANGELES

READING
GUARANTEED GENUINE
WROUGHT IRON PIPE



New No. 40 Sash

Announcing The Latest Development

IN

Kawneer SOLID COPPER STORE FRONTS

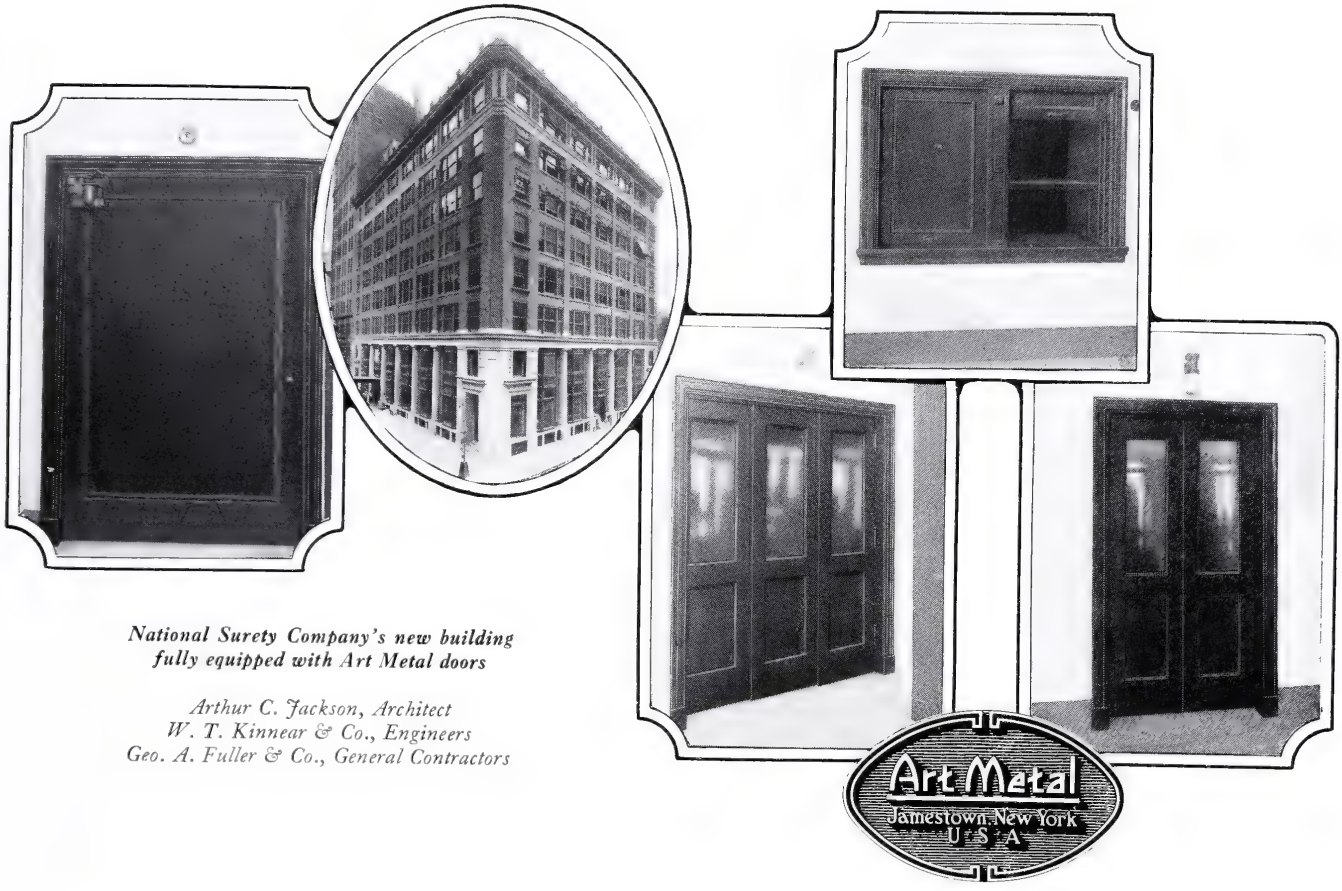
As the originators and inventors of resilient, solid copper settings for plate glass, we take pleasure in announcing a new sash in our Kawneer Store Front contruction. It is our belief that because of its extra strength and pleasing architectural lines that this new No. 40 sash will make a strong appeal to architects and builders.

Extra heavy guage metal used in this new sash enables it to be installed without backing, and with any kind of sill: marble, stone, tile or concrete. Machine adjustment screws afford accurate control of the grip on the plate glass. Of course, Kawneer Resiliency is a basic feature. Ventilation and drainage controlled by slide in the gutter member may also be had when desired.

We are now distributing samples of this new sash to architects. Our new Catalog L containing full size details is just off the press. If you will drop us a line giving your office address we will gladly send both sample and catalog at once.

THE Kawneer COMPANY

2420 Front Street, Niles, Michigan



National Surety Company's new building fully equipped with Art Metal doors

Arthur C. Jackson, Architect
W. T. Kinnear & Co., Engineers
Geo. A. Fuller & Co., General Contractors

Another Big New York Institution Adopts Art Metal Interior Equipment

THAT the best architects and construction engineers appreciate the greater effectiveness of Art Metal is again demonstrated in the new National Surety Building, just being completed in New York.

The entire equipment includes nearly two hundred doors built for various requirements,—for elevators, stalls, dumbwaiters and extra wide openings in halls. These last are 58 inches in width. They are hung on one and one-half pairs of heavy 5-inch butts—a *standard specification* for all Art Metal door installations that meets even the unusual demand.

Art Metal combines exceptional engineering production and service facilities with a third of a century of experience in the design and fabrication of steel and bronze for interior equipment.

Art Metal is better than ever equipped to render the highest type of architectural hollow metal service. Let us submit details and estimates on your next installation.

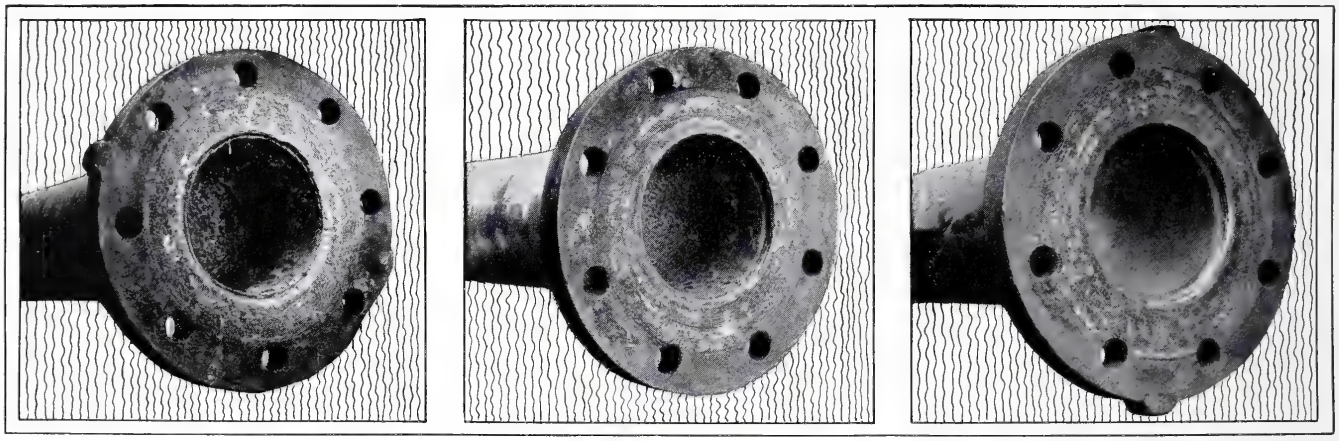
Art Metal

JAMESTOWN, NEW YORK

World's largest maker of steel and bronze interior equipment

The story of a HOT WATER FEED PIPE

In Three Parts



Part 1—Black Steel carried hot water at 200 degrees F. for eight years.
Worn down to threads; rough, pitted.

Part 2—Galvanized Genuine Wrought Iron carried hot water at 200 degrees F. for eight years.
Worn down to threads; projecting nodules of rust.

Part 3—Bridgeport Plumrite Brass Pipe carried hot water at 200 degrees F. for seven years.
No wear; surface smooth and clean.

Which is the best?
—which do you use?

CONSIDER the relative amounts of friction in these three pipes—the color of the water delivered by the steel and iron pipes and their probable condition three years later. If experience counts they will be worn out and replaced by Plumrite Brass Pipe.

Only in Plumrite Brass Pipe do you get the right combination of metals, evenly distributed, and correctly heat-treated to withstand severe service conditions.

Bridgeport BRASS CO TRADE MARK

BRIDGEPORT BRASS COMPANY, Bridgeport, Conn.

Bridgeport Plumrite *The Improved* Brass Pipe
REG. U. S. PAT. OFF.

If you are at all interested in the subject of water service piping, we shall be glad to send you, when issued, a copy of our book, "Brass Pipe and Piping." It deals with corrosion, its theory and prevention; discusses the advantages and disadvantages of the various pipe metals; and gives instructions for handling brass pipe, laying out installations and figuring costs. Copies are gratis on request —use this coupon.

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Firm _____

Address _____

2220-4-41

The Cunard Building located at Broadway and Bowling Green, New York
Benjamin W. Morris, Architect
Lord Electric Co., Electrical Contractor

Wired with Sherarduct

THIS splendid new home of the Cunard Steamship Company has its electric wiring system protected by SHERARDUCT—the incomparable Rigid Steel Conduit.

Sherarduct is specified and installed wherever electrical conduits of the highest quality are required. Its Sherardized *and* Enameled surfaces—both inside and out—make it the one conduit that resists rust.

National Metal Molding Co.
Pittsburgh, Pa.

RELIANCE FIREPROOF PRODUCTS

National Surety Building, Washington and Albany Streets, New York City. Arthur C. Jackson, architect, George A. Fuller Company, building contractors

The National Surety Building is typical of the modern type of business structures equipped with Reliance Fireproof Products. This notable building has Reliance Copper Kalamein Doors and Reliance Bay Windows throughout the first two stories.

Reliance doors, windows, partitions and trim are absolutely fireproof. Their attractiveness and permanence add that touch of refinement and character always sought for by those architects who seek to combine beauty with utility.

May we furnish estimates covering the work you now have in hand?

Reliance Fireproof Door Co.

47 Milton St.

Brooklyn, N. Y.

ELASTICA is the only magnesite stucco known that is shipped to the builder ***"Complete in a Sack."***

Furthermore, it is the only stucco of any kind on the market that is thoroughly ***Waterproofed*** and fully covered by manufacturers' ***guarantee.***

For particulars write

AMERICAN MATERIALS CO.
101 Park Avenue, New York, N. Y.
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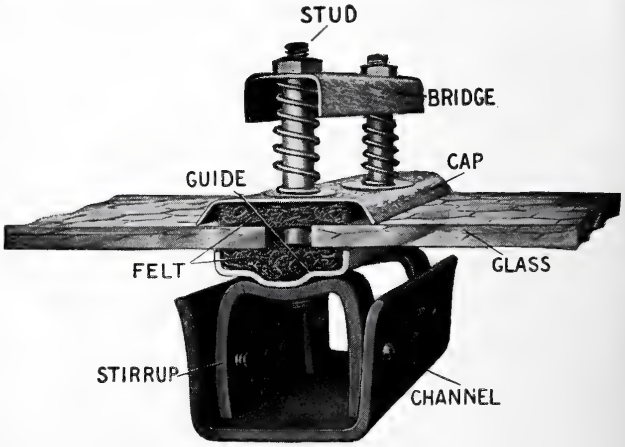
ELASTICA
THE IDEAL EXTERIOR WALL COVERING

Copyright U. S. Materials Co., 1922

Skylights for Schools



Installations of "Anti-Pluvius" Puttyless Skylights are not limited to industrial buildings.

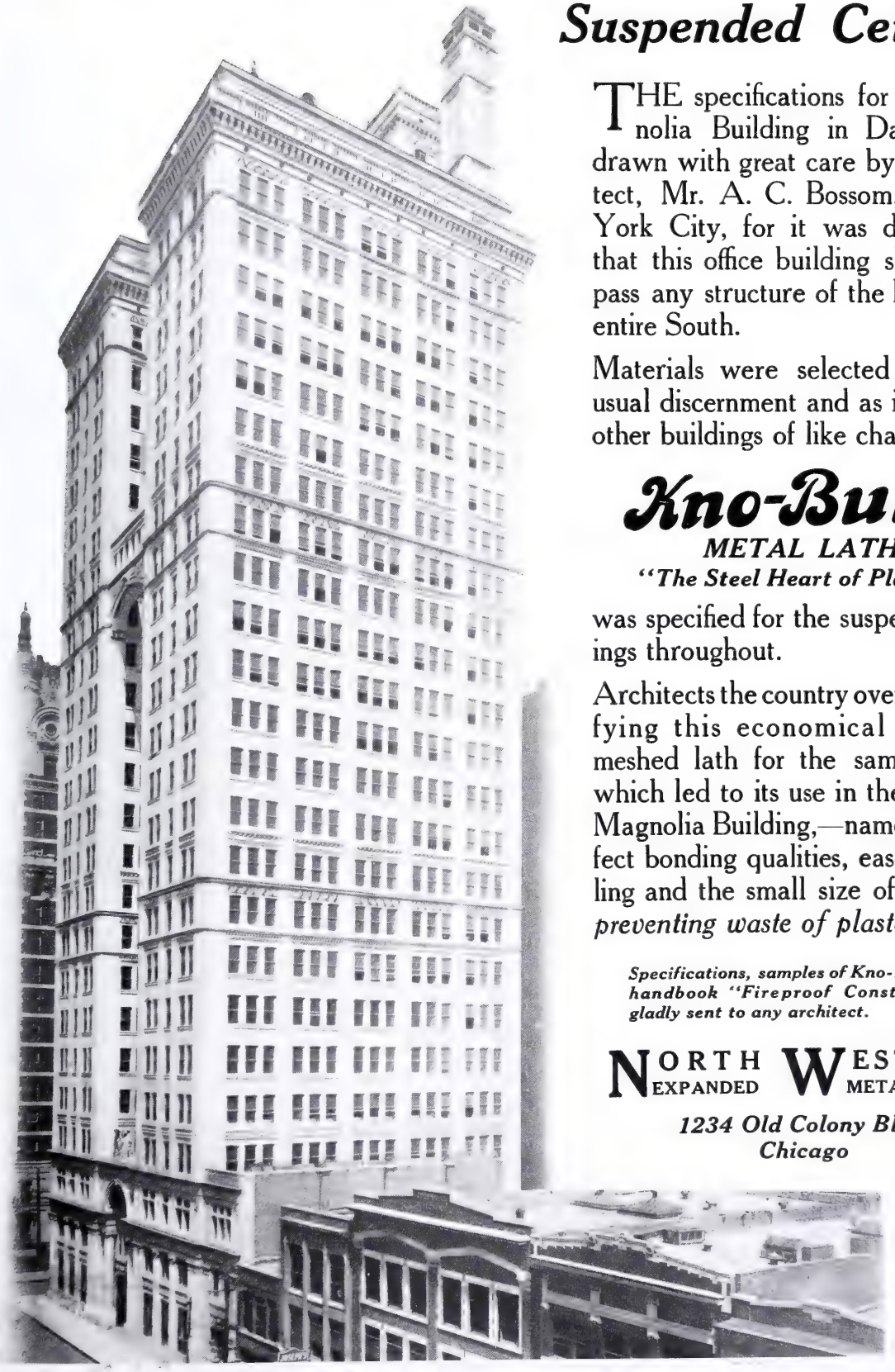
The Tsing Hua College, Pekin, China, is an example of their use in schools. They have also been widely used in public and private buildings of all kinds.

Complete catalogue will be sent upon request.

THE G. DROUVÉ COMPANY
Bridgeport, Connecticut, U. S. A.

DAYLIGHT HEADQUARTERS

The Finest Office Building in the South Required 30,000 Yards of Kno-Burn for its Suspended Ceilings



THE specifications for the Magnolia Building in Dallas were drawn with great care by the architect, Mr. A. C. Bossom, of New York City, for it was determined that this office building should surpass any structure of the kind in the entire South.

Materials were selected with unusual discernment and as in so many other buildings of like character

Kno-Burn
METAL LATH
"The Steel Heart of Plaster"

was specified for the suspended ceilings throughout.

Architects the country over are specifying this economical diamond meshed lath for the same reasons which led to its use in the beautiful Magnolia Building,—namely its perfect bonding qualities, ease of handling and the small size of its mesh, *preventing waste of plaster.*

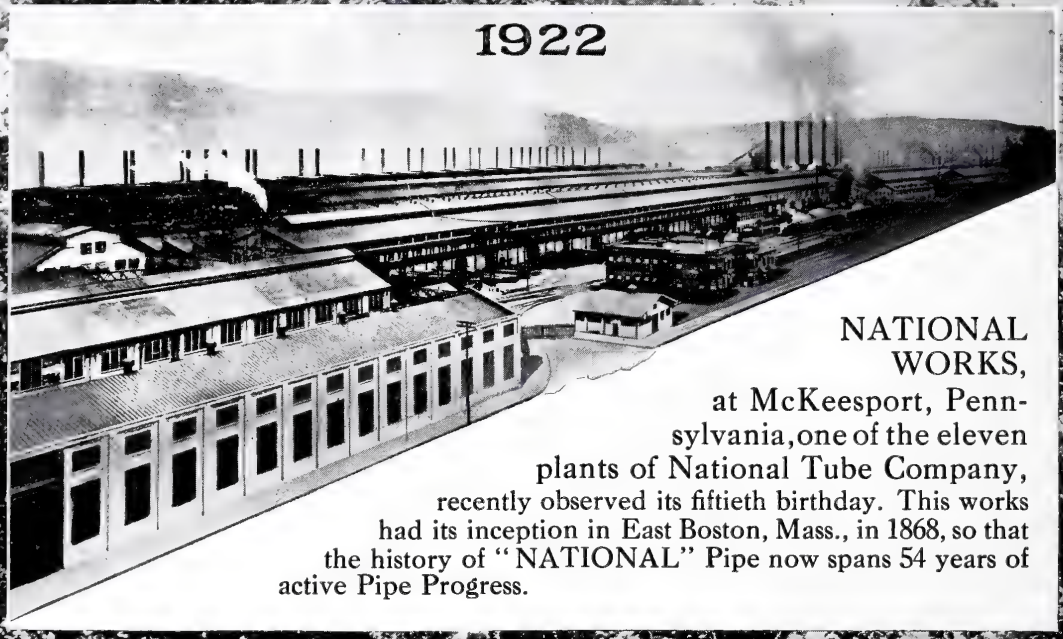
Specifications, samples of Kno-Burn, and handbook "Fireproof Construction" gladly sent to any architect.

NORTH WESTERN EXPANDED METAL CO.

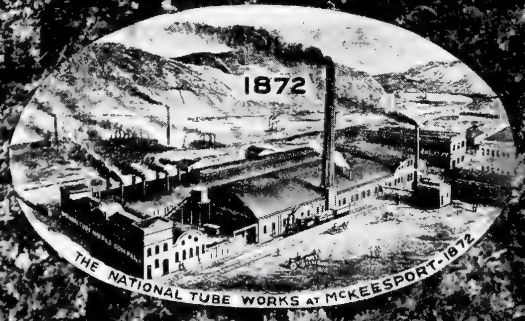
1234 Old Colony Bldg.
Chicago

A Half Century

1922



NATIONAL WORKS, at McKeesport, Pennsylvania, one of the eleven plants of National Tube Company, recently observed its fiftieth birthday. This works had its inception in East Boston, Mass., in 1868, so that the history of "NATIONAL" Pipe now spans 54 years of active Pipe Progress.



TUBE WORKS MARKS 50 YEARS' EXISTENCE

Officials and Men Observe Anniversary of McKeesport Company.

VETERANS STILL ON JOB

Officials and veteran employes of the National Tube Company of McKeesport yesterday observed the fi

Plant Observes Fiftieth Anniversary

On Sept. 13, 1872, the first pipe was turned out at the McKeesport, Pa., plant of the National Tube Co., and last Wednesday, the fiftieth anniversary of that event was observed by officials and veteran employees. Among the latter were two who were employed at the plant at its opening and who still are in active harness, Daniel Turley and Patrick Bligh.

The first product of the plant was 2-in. boiler tubes. Now the range of products includes all kinds of tubular goods, of sizes running from ⅛ in. to 30 in. in diameter. The original plant occupied only four acres and consisted of one small building. There are now scores of buildings, one of which is the largest mill under one roof in the world, while the plant as a whole is he largest de[illegible] products in the world.

National Tube Co. Fifty Years at McKeesport

Largest Pipe Mill in the World Has Had Interesting History Marked by Progressive Management and Successful Operation

National Tube Co., Pittsburgh, manufacturer of the universally known "National" pipe, celebrated on September 13 the fiftieth anniversary of the opening of its big McKeesport plant. Executives of the company, veteran employes and citizens of the city of McKeesport made the day a memorable one. It is the proud boast of the community that fifty years ago the largest pipe mill in the world was located there, and that today it can still make the same claim.

It must be remembered that the history of the company antedates its connection with McKeesport, for in 1869 John H and Harvey K. Flagler

Pennsylvania, that the of the company de cided to seek a pla port was [illegible] lo [illegible]

September 21, 1922

National Tube Observes Fiftieth Anniversary

The fiftieth anniversary of the making of pipe by the National Tube Co., McKeesport, Pa., was celebrated Sept. 13 by officials of the company and its veteran employes. Men who helped to make the first pipe are living and several of them

"Great Oaks From Little Acorns Grow"

# of Pipe Progress

AFTER FIFTY YEARS existence—whether it is a man's personal life, a great political movement, a notable industry or invention, this seems a natural point at which to stand and look back over the accomplishments and failures of the half century, and to balance the realization of today against the struggles of the passing years.

From a modest beginning in 1872, with a small plant and a few acres of ground, the history of National Works of National Tube Company has been one of continual progress, until today it stands unrivaled in its position of leadership among plants manufacturing tubular goods. Keeping abreast of the times, keeping faith with the consumer, and with a desire to serve in an ever-increasing measure, is the keystone upon which the progress and growth of the plant has been made.

This anniversary has attracted editorial attention throughout the country, and as typical of such the following is quoted from the *Journal of Commerce*, Philadelphia, September, 30, 1922.

"When one glances back over the pages of manufacturing and commercial pursuit during the past half century he will find much to interest him in the origin and inception of the leading concerns of the present day, for the onward and upward career of these enterprises in the majority of instances is merely the substantial fruit of success which usually comes to reward intelligent and energetic effort, no matter in what direction or in what capacity it may be applied.

Tracing the history of prominent and old established Pennsylvania enterprises it will be found that there is probably none which enjoys a wider prestige and reputation in its special line of activity than the National Works of National Tube Company located at McKeesport, Pa., which a few days ago had the pleasure and satisfaction of celebrating the 50th anniversary of its founding. It is one of the oldest concerns of the country and has developed to its present large proportions from a small beginning, but its growth and expansion have been consistent and gainful. The real secret of the continued success of the firm will be found in the fact that its management has always proven it is fuily in touch with the progress and trend of the times, studiously striving to place upon the market a line of products that would sell themselves through the efforts of their own merits and qualities.

The people of McKeesport are naturally proud of the past record, present stability and future promise of the city's representative commercial and manufacturing enterprises; proud of that integrity of business dealing and consistency of energy of purpose which successfully meet the commercial rivalry and competition, because of known quality of product and reliabitity of service; proud of that up-to-date spirit of effort and endeavor which makes the success of the past the foundation upon which to build and plan for still greater achievements in the future, and in all of these essentials the National Tube Company is typical of that commercial energy and enterprise which won for the United States a position of leadership among the nations of the world."

The Pipe that for more than fifty years has been

The Recognized Standard of Wrought Pipe Quality

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

General Sales Offices: Frick Building.

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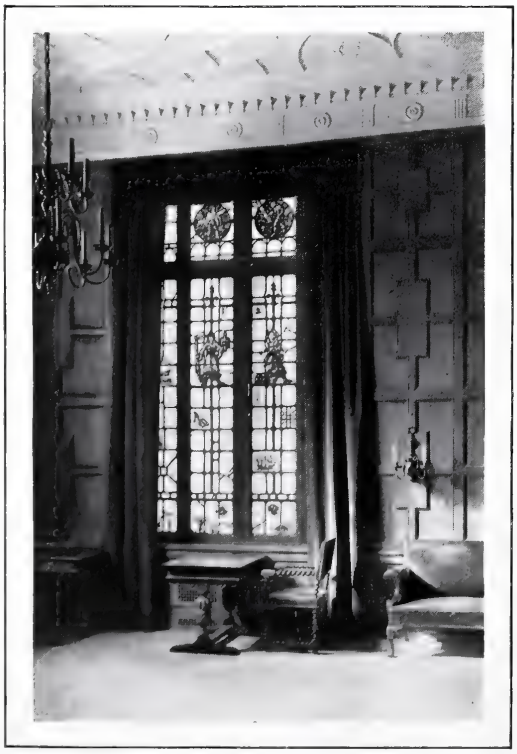
Store Building
Buffalo, N. Y.

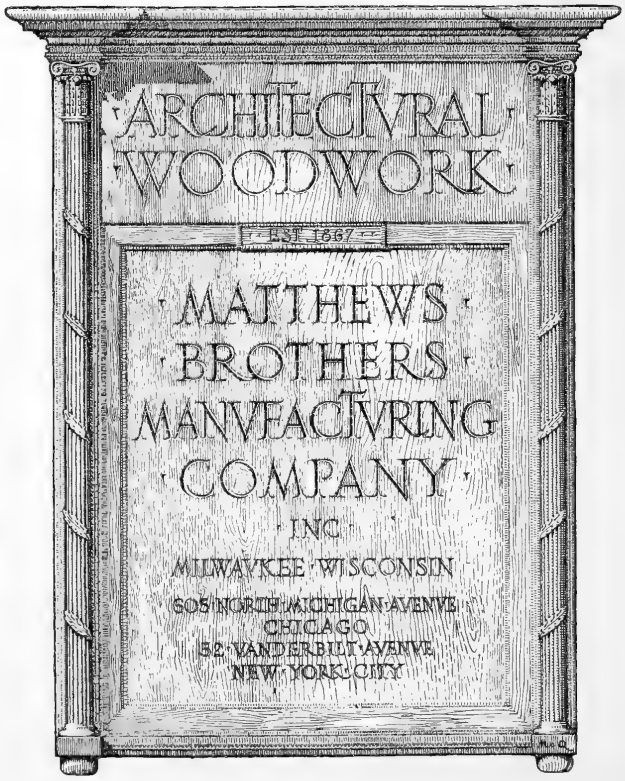
Eli W. Goldstein
Architect

COPY OF OUR STORE FRONT BOOKLET SENT UPON REQUEST

THE NEW JERSEY TERRA COTTA COMPANY

OFFICE, SINGER BUILDING, NEW YORK CITY ESTABLISHED 1888 WORKS, PERTH AMBOY, NEW JERSEY





THE BRISTOL COMPANY

Showroom:
154 East 55th Street

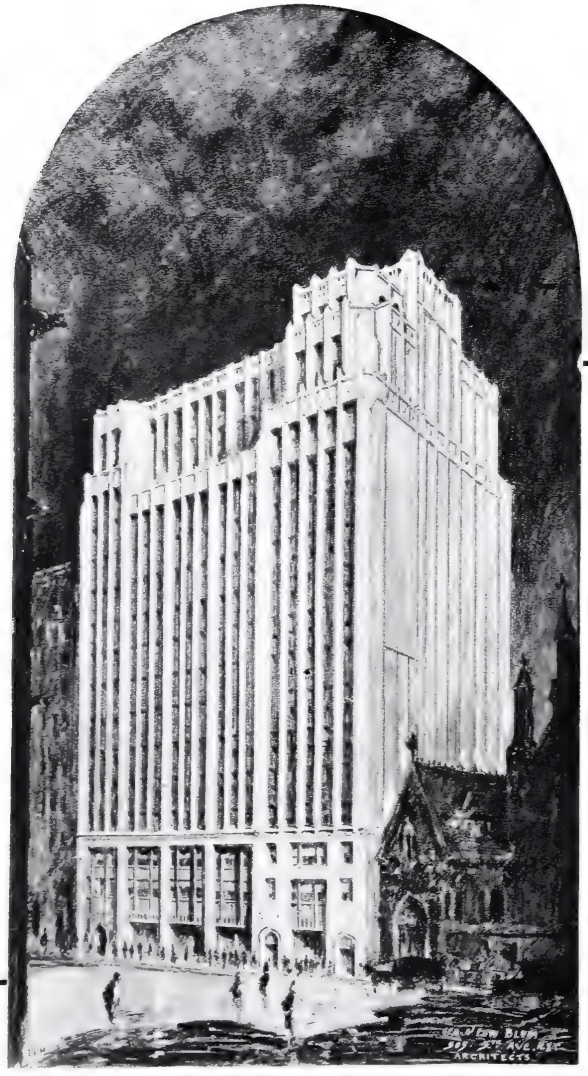
NEW YORK

Factory and Warehouse:
340-342 East 38th Street

A corner of the Bristol Paneled Room at the Art-in-Trade's Club exhibit held at the Waldorf Astoria

REQUISITES FOR UNUSUAL INTERIORS
ANTIQUES LIGHTING FIXTURES
PANELED ROOMS TAPESTRIES

FISH BRICK



The Gilbert Building
205-223 West 39th Street, New York City
Geo. & Edw. Blum, *Architects* J. E. Gilbert, *Director*
205 West 39th Street Co., Inc., *Owner* George Colon Co., *Builder*

Our Factory No. 1 Gray Smooth Face Brick used for facade of Gilbert Building.

A large selection from which to choose, varying both in texture and color, is offered in Fish Brick.

"Fish Brick Service" means the delivery of brick "on the job" on time.

Architects of large building projects which require immense quantities of face brick select Fish Brick and Fish Brick Service.

Samples and quotations supplied without obligation

Fish Brick Sales Company

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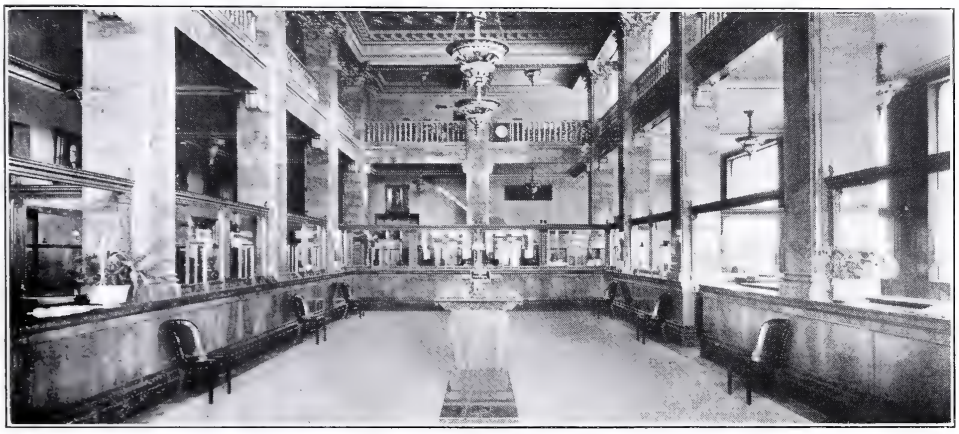
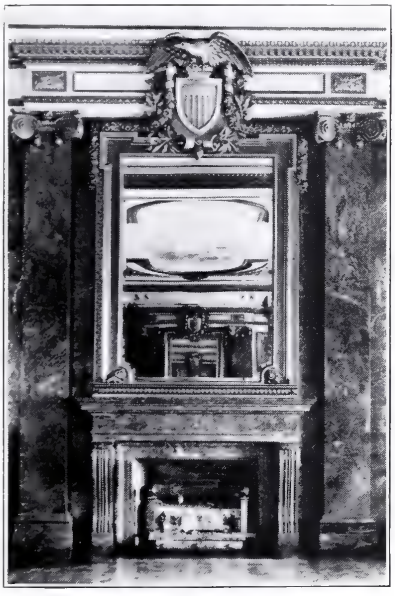
Represented throughout the United States and Canada



Desert National Bank, Salt Lake City, Utah. Light Nebo Golden Travis Marble for columns, mezzanine and balustrade is superimposed in a Dark Golden Travis Base, sub-base and counter
Cannon & Fitzer, Architects



Mantel of Dark Nebo Golden Travis, in Governor's Reception Room, State Capitol, Salt Lake City, Utah. Also used in the Administration Building, Latter Day Saints, Salt Lake City. R. Klettering, Architect

A Golden Marble From the Golden West

FROM that part of the Golden West where the Great Salt Lake reflects the gold of the setting sun, comes Nebo Golden Travis Marble.

It is a sunlit marble.

For those of your decorative schemes that will allow of its rich variegated, sun touched colors, this marble can be had in two different tones.

Sunlight or strong artificial light makes them the more beautiful.

A faithful reproduction of it, in its natural colors, is in our folio of color prints.

A copy of this we would be glad to send you, or confer with you in detail on any marble problem you may have.

TOMPKINS-KIEL MARBLE COMPANY

505 FIFTH AVENUE
NEW YORK CITY

DISTRIBUTORS MARBLE-STONE

CHICAGO
PHILADELPHIA
SAN FRANCISCO

By-pass valves in the Deshler Bath Fixture make it easy to put a shower over the tub

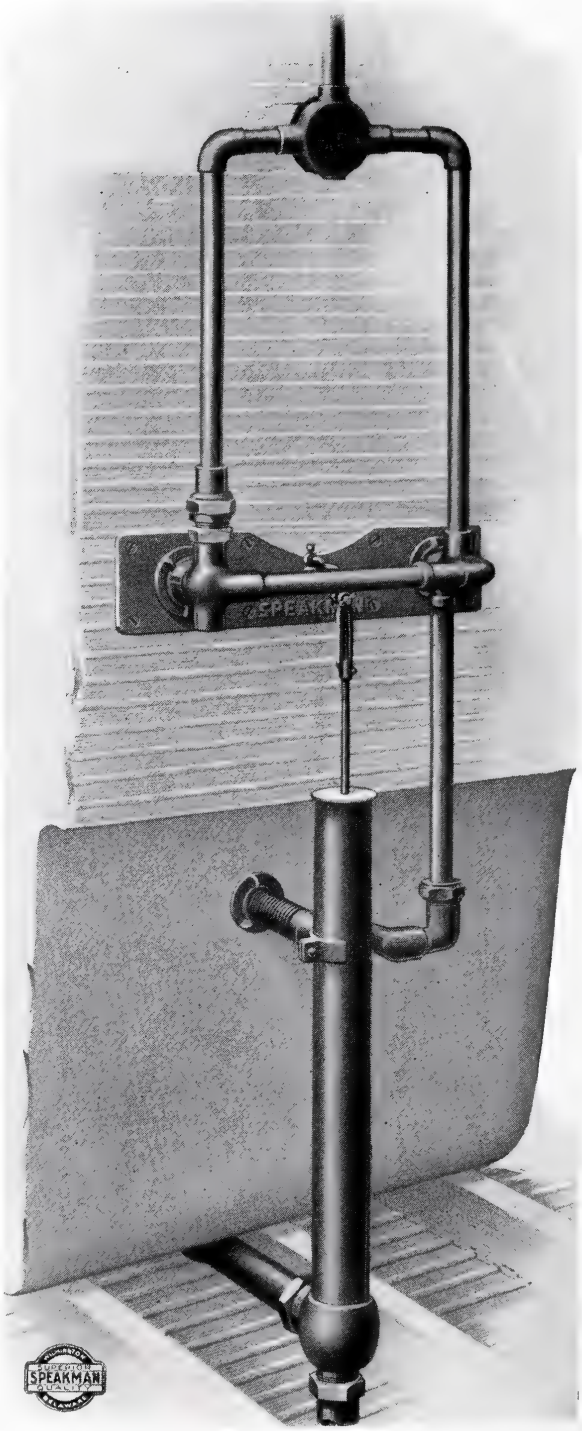
NOT only this, but there is a saving in fittings, labor and chances of leak. Then again, cutting of studding is eliminated when the Deshler Bath Fixture is used.

Valves in the Deshler Bath Fixture have *renewable* Hi-Seat — 1⅜″ from the face of the wall instead of 3″ as is the case ordinarily.

All Speakman Hi-Seat Valves (patented) have this same *renewable* feature.

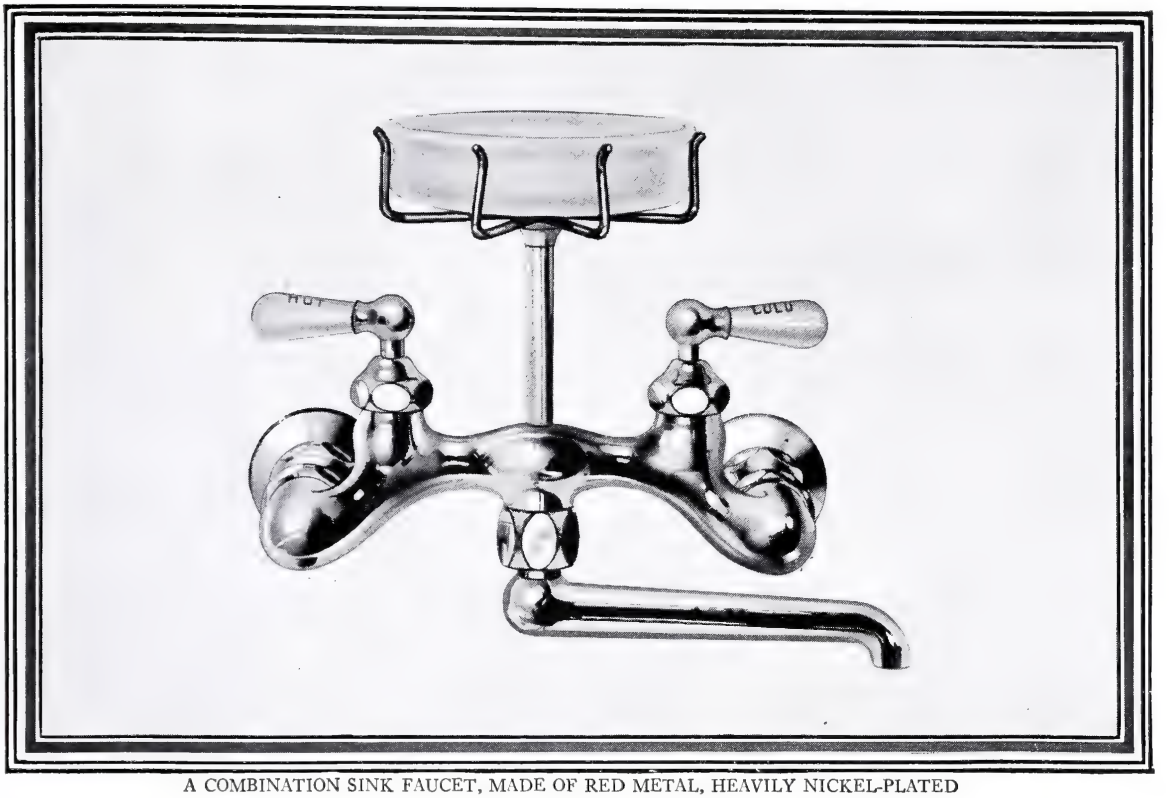
"Connecting the Shower" is a folder which tells of ten other features of the Deshler Bath Fixture. We'll gladly send you a copy. Also, if you wish, send our catalog H.

SPEAKMAN COMPANY
WILMINGTON, DEL.



Wash and Bathe in Running Water

SPEAKMAN SHOWERS



A COMBINATION SINK FAUCET, MADE OF RED METAL, HEAVILY NICKEL-PLATED

MAKING LIFELONG CUSTOMERS

The convenience, the attractive appearance and the durability of Crane brass faucets, stops and cocks make an emphatic appeal to every householder. Extra heavy design and construction in all fixtures and the absence of sharp edges and dirt-collecting grooves are visible assurance of their perfection. Non-corrosive, tough red metal is used in their manufacture. Heavy nickel-plating provides a lasting finish. Substantial patterns and accurate workmanship make them withstand the hardest usage. The proper installation of Crane fixtures is a factor in building new trade and keeping your present customers satisfied.

CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

Branches and Sales Offices in One Hundred and Thirty-five Cities
National Exhibit Rooms: Chicago, New York, Atlantic City
Works: Chicago and Bridgeport

"Telsa" Wash Sink Faucet

The MADBURY

Vitreous China in plumbing fixtures is an assurance of SERVICE—service in labor saved and service in safeguarding health. Therefore, isn't it advisable to specify Vitreous China fixtures whenever and wherever possible?

SPECIFICATION:

White Vitreous China Straight Front Lavatory; Size (see below) with Integral Supply Nozzle, Cleansing Overflow Feature, Square Bowl, Hooded Overflow, Anti-splash Rim, Plain Square Pedestal and N. P. Brass Wall Brackets. Fitted with Compression Supply Valves with China Crossarm Handles and Escutcheon and Pop-up Waste with China Knob and Escutcheon with 1¼ inch or 1½ inch N. P. Brass Non-syphoning Trap to Wall and ⅜ inch N. P. Brass Supply Pipes to Wall with China Handle Stop Valve and China Wall Escutcheons.

DIMENSIONS:

Lavatory, inches	20 x 24	22 x 27	24 x 30

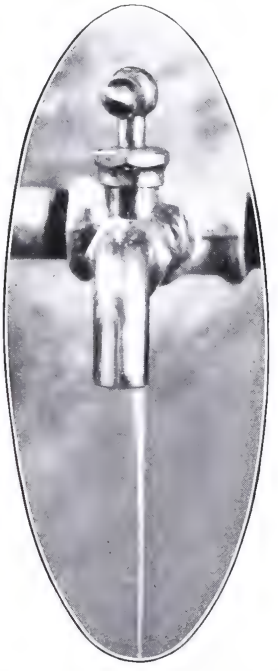
THOMAS MADDOCK'S SONS CO.
TRENTON, N. J.

Plumbing Facts

Water Just Leaking Drop by Drop

15 gallons per day
105 gallons per week
5,475 gallons per year

Cost per day	$ .00375
Cost per week	.02625
Cost per year	1.36875



Water Leaking Through One-Fourth Inch Aperture

17,425 gallons per day
121,975 gallons per week
6,360,125 gallons per year

Cost per day	$ 4.356
Cost per week	30.493
Cost per year	1590.031

Water Leaking Through One-Half Inch Aperture

70,488 gallons per day
493,416 gallons per week
25,728,120 gallons per year

Cost per day	$ 17.622
Cost per week	102.354
Cost per year	6432.03

NO other single item causes more trouble and repair bills for your client than does faulty plumbing. Think of your own personal experience.

The greatest cause of plumbing trouble and repairs is due to the use of cheap brass trimmings. Don't permit the use of anything but the best in plumbing brass goods.

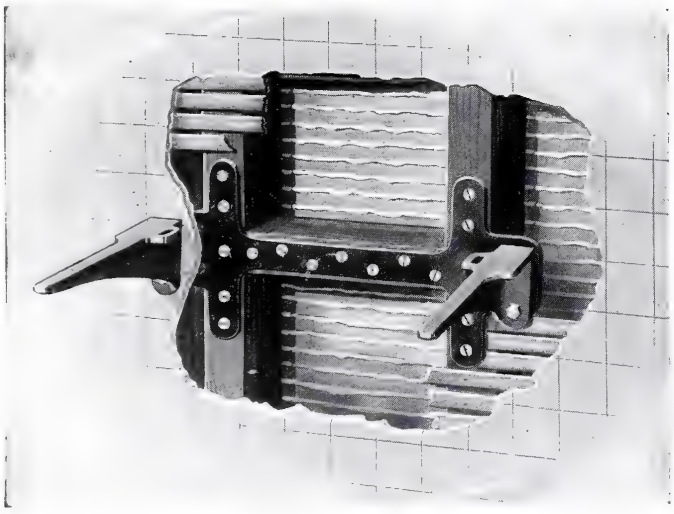
Clow Trimmings are of red metal, designed in every detail to stand hard usage and long wear. When you specify "Clow plumbing throughout" you insure your client against future troubles.

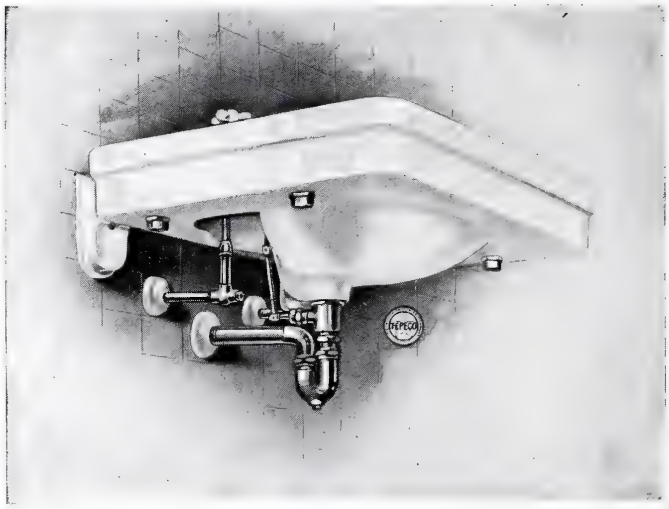
JAMES B. CLOW & SONS
General Offices: 534-546 South Franklin Street, Chicago
Sales Offices in the Principal Cities

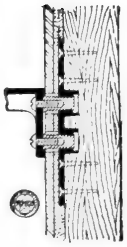
CLOW

Tepeco Vitreous China Lavatories

Installed on Concealed Wall Carrier





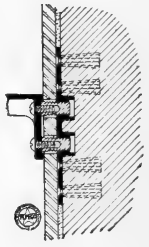


Cross Section showing how the Wall Carrier may be fastened to a stud partition, with screws.

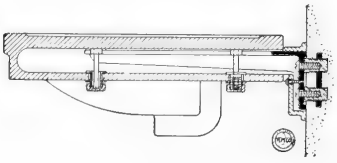
THE desire to cover the large bracket required in the installation of a wall-hung lavatory has resulted in various designs of bracket housings which not only present a clumsy appearance, but increase the cost of fixture considerably.

The above lavatory is made so as to conceal the bracket in between the lavatory and wall being covered by a china escutcheon. This eliminates both the bracket and housing from under the lavatory, which gives not only a much better-looking installation but accomplishes the object in a more economical manner.

The cross section below shows in detail the construction of bracket and how it is secured to the lavatory. Note the adjustment provided in the bolts locking the lavatory to bracket, which also provides for leveling of the lavatory.



Cross Section showing how the Wall Carrier may be fastened to masonry, with expansion bolts.



THE TRENTON POTTERIES COMPANY

TRENTON, NEW JERSEY, U. S. A.

BOSTON NEW YORK

SAN FRANCISCO

World's Largest Makers of All-Clay Plumbing Fixtures

Our New Catalogue Shows these Details

If our new Catalogue R is not on your desk, by all means send for a copy. Architects who have seen it quite generally pronounce it the most completely comprehensive catalogue of plumbing fixtures in their experience. Not only are complete specifications given, but the detail drawings are invaluable in showing exactly how and when a certain type should be used.

Garage Layout Problems Disappear

When the d'Humy Motoramps are used

Arrange the cars ideally, as you would if the building were only one story high; then mark off the car rows into bays and place the d'Humy Motoramps wherever most convenient to connect any two of the car aisles.

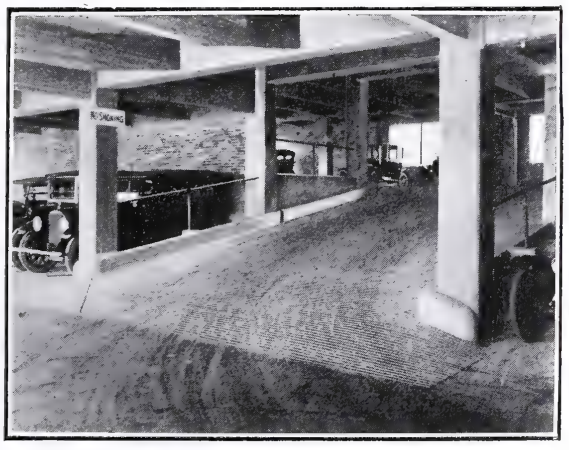
Single track, up-and-down, d'Humy Motoramps subtract only eight car spaces per floor from the ideal one-story layout—and double track d'Humy Motoramps (desirable for buildings of more than 300 cars capacity) require only sixteen car spaces. That is why the use of the d'Humy Motoramp System invariably results in a building of the LOWEST COST PER CAR.

For example, in a certain five-story garage, 100 x 220 feet, costing $2.25 per square foot, the building costs per car were found to be:

With ordinary ramps	$600.00
With two elevators	537.00
With d'Humy Motoramps	493.00

And, with a monthly rental of $25.00 per car space, the comparative yearly income would stand:

With ordinary ramps (225 cars)	$67,500.00
With two elevators (270 cars) and deducting elevator operating expense	77,100.00
With d'Humy Motoramps (280 cars)	84,000.00



The earning power of the building is so greatly enhanced that it is easy to see why d'Humy Motoramps are specified by so many architects.

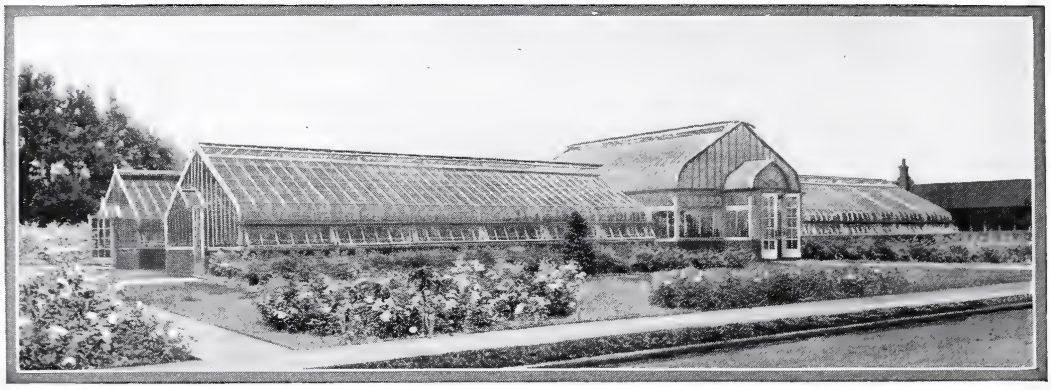
This system of design has the added advantage of affording the safest, quickest and most convenient form of interfloor travel. The half-length ramps give perfect "visibility"; they are never an inclined tunnel. d'Humy Motoramps assure the success of the enterprise because the building wins the good will and enthusiastic support of every motorist who uses it.

Ask us to prepare, without obligation, miniature sketch plans for that job on which you are now working, together with an analysis which will prove that the d'Humy Motoramp System will give the lowest cost per car and the highest investment return.

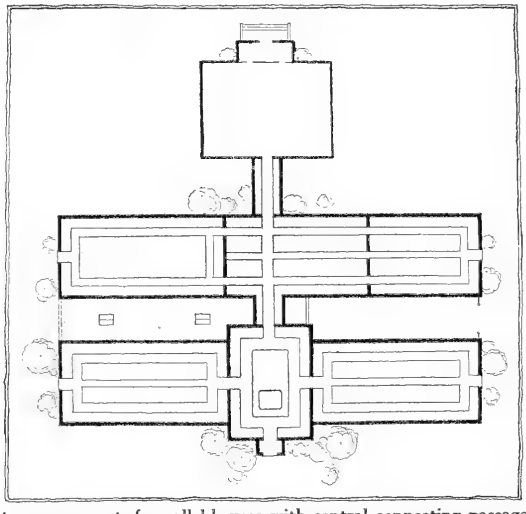
RAMP BUILDINGS CORPORATION
115 Broad Street, New York
Representatives in all Principal Cities

To extend its service more completely the Company desires a few additional structural engineers to act as representatives in certain territories still open.

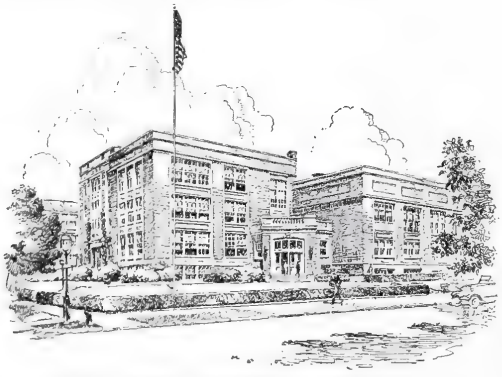
d'Humy Motoramps—a Patented System of Building Design involving a combination of ramps with staggered floors



Range of growing and experimental greenhouses erected for the West Technical High School at Cleveland, Ohio. It occupies quite the same relation to the courses of botany and horticulture, as does the laboratory to chemistry and physics. You will be interested to know that the Western States were the first to add greenhouses to their school equipment.



Its arrangement of parallel houses with central connecting passage house and adjoining workroom at the back is a layout that has over and over proved its practicalness. Not the least in its favor is the economy of heating and convenience in working.



West Technical High School, Cleveland, Ohio
Board of Education, Architects Central Dredging Co., General Contractors

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Greenhouse and Conservatory Builders

Home Office and Factory, Elizabeth, N. J.

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101 Park Avenue	611 Commerce Building	133 South 12th Street	294 Washington Street

THE BRUNSWICK-BALKE-COLLENDER CO'S
WHALE-BONE-ITE
REG. PAT. OFFICE
CLOSET SEATS

No. 21-9

Whale-Bone-Ite Toilet Seats

WILL EQUIP

OMAHA'S NEW TECHNICAL and COMMERCIAL HIGH SCHOOL
OMAHA, NEB.

FREDERICK W. and EDWIN B. CLARK, Architects, Omaha, Neb.
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The Test of Time Demonstrates

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Toilet Seats' Superiority

SPECIFIED BY LEADING ARCHITECTS, ENGINEERS
AND OWNERS WHO WANT THE BEST

SANITARY
DURABLE

SOLD BY ALL JOBBERS

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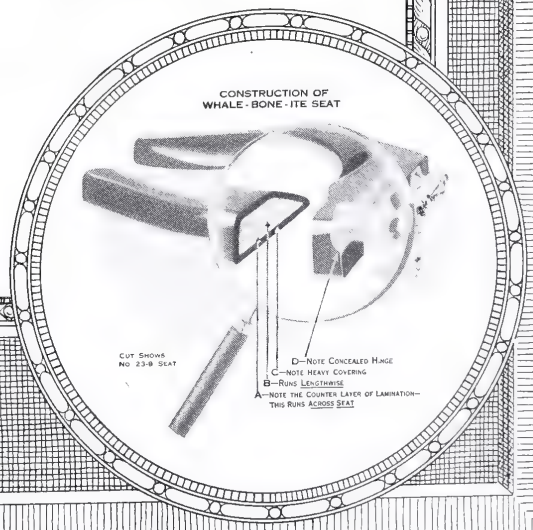

THE BRUNSWICK-BALKE-COLLENDER CO.
623 SO WABASH AVE. CHICAGO

Manufacturers' Catalogs and Business Announcements

CATALOG REVIEWS

DAVID LUPTON'S SONS CO., Philadelphia. "Steel Windows." Catalog 110.

The attention which is being given to the windows used in buildings of many different types is one of the secrets of the buildings' success. This is particularly true of schools, where windows must nowadays often conform to certain well defined requirements, of factory buildings and sometimes of hospitals, where in order to admit the necessary light and air large wall areas are often given up to windows which must be easily manipulated in order to be practical. All this has meant the increasing use of steel sash, and their obvious advantages are now causing their wider use in residences, apartment houses, office buildings and for certain modern types of store fronts. The chief advantage of steel over wood for use in windows lies of course in its strength, making possible a slender steel muntin which notwithstanding its slenderness possesses far greater strength than a wood muntin many times its size, with consequent advantages for admitting light; the same strength and the fact that a steel sash is welded into one solid piece of rolled metal provide a rigidity which precludes the danger of its being blown in or twisted from its setting by the force of the wind; it is also close-fitting and free from rattle.

In this booklet the manufacturers of several types of steel windows emphasize the value of their products for buildings of different types, particular stress being laid upon their "projected windows" which are especially useful since they may be opened in several ways, secured in a number of positions, and easily reached for cleaning upon both sides. The booklet also contains detailed drawings illustrating the requirements where such windows are used in walls of wood, concrete or brick. Although chiefly devoted to the subject of "Steel Windows," more or less information is given regarding other products of the company, such as counter balanced sash, pivoted sash, pressed steel door frames, toilet partitions, shelving and factory equipment.

RUSSELL & ERWIN MFG. CO., New Britain, Conn. "Catalog of Hardware, Volume 13." 382 pp., 8 x 10¾ ins.

There are few details of interior finish which are more important in the average building than its hardware, which includes the locks and other metal fittings for doors and windows, wall fittings where electric bells and signals are required, hooks for closets and wardrobes and the metal letters and numbers which are useful for various purposes. This substantial volume is the latest of a series of catalogs which list for the convenience of architects and builders the many patterns and sizes in which the widely known "Russwin" products are made.

The growth of good taste in building is illustrated in the constant improvement in the design of the details which are used in building equipment, and is proved by the definite tendency toward the use of period design which is evident in this volume. There are none of the historic styles of architecture likely to be used today for which well designed hardware is not illustrated, emphasis being placed upon patterns in styles sure to be the most used, such as the colonial, the Georgian and the Adam, and the simpler forms of Louis XVI.

It is necessary in correctly estimating the hardware for buildings to have a complete knowledge of the requirements, and essential, therefore, to have an accurate list or "schedule" of all the hardware needed. The contractor estimating this item is almost always obliged to compile such a schedule from the architect's blue prints and specifications, and in the preface to this catalog there are given some directions which should make for accuracy in compiling such schedules.

ANNOUNCEMENTS

Brentwood S. Tolan, architect, formerly of Fort Wayne, Ind., is now associated with De Curtins & Rawson under the firm name of De Curtins, Rawson & Tolan, with offices at 503 Opera House Block, Lima, Ohio.

Jacob Weinstein, architect, has removed his offices to the Metropolitan Bldg., State and Chapel streets, New Haven, Conn.

Wellington J. H. Wallace, Bartlesville, Okla., announces his appointment as architect for the Baptist Sunday School Board, of Nashville, where he will be located. Manufacturers' catalogs and samples relating to church and Sunday-school buildings are requested.

George Lawrence Smith, architect, announces the removal of his office to 5 Park street, Boston.

Harvey H. Warwick announces the removal of his office to 1108 Sixteenth street, N. W., Washington.

Norman Hatton announces that the partnership formerly known as Hatton, Holmes & Anthony has been dissolved. Mr. Hatton will continue the practice of his profession at the same address, 321-2 O. R. C. Bldg., Cedar Rapids, Iowa.

Smith, Hinchman & Grylls have moved their offices from the Washington Arcade Bldg. to the 8th floor of the Marquette Bldg., 243 Congress street, Detroit.

VAN RENSSELAER P. SAXE, C.E.

Consulting Engineer

STRUCTURAL STEEL
CONCRETE CONSTRUCTION

Knickerbocker Building Baltimore, Md.

SONNEBORN PRODUCTS

Grind-Proof and Dust-Free Concrete Floors!

Perfect Concrete Floors
No Dusting—No Disintegration

Safeguard yourself—forestall any chance of clients' dissatisfaction, due to concrete floor troubles.

Lapidolith, the liquid chemical, is now the standard specification for the dustproofing and wearproofing of old or new concrete floors.

Let us refer you to a lapidolized floor near you, or to architects of your acquaintance who know Lapidolith and who always specify it.

LAPIDOLITH
TRADE MARK

The Liquid Chemical Dustproofer and Wearproofer of Concrete Floors

Other Sonneborn Products:

HYDROCIDE

A black tacky material for waterproofing foundations and dampproofing the interior of exposed walls. No furring or lathing necessary. Binds perfectly with plaster.

HYDROCIDE INTEGRAL

To be mixed with the cement for waterproofing mass concrete against water pressure. Powder or paste.

FERMO

A liquid chemical which hastens the set of concrete and mortar. Saves time—prevents freezing.

completes the hydration of the Portland Cement and makes the mass granite-hard for all time.

It also increases the density of the concrete, so that it becomes impervious to water and so is widely used in treating concrete tanks and swimming pools.

Lapidolith is the original concrete hardener—standard for twelve years.

Write to Technical Department for specification forms, sample and details.

L. SONNEBORN SONS, Inc.
Dept. 4 116 Fifth Ave., New York

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Combination
Gas Water Heater
Made in 6 Sizes

25% Greater Heat Efficiency

THE heating principles and special design incorporated in this WOLFF Combination Gas Water Heater are the outcome of many years of manufacturing study and experience. We have *proved* its ability to produce

Hot Water *in* Less Time *with* Less Gas

The *Double Disk heating principle* makes possible quicker operation, a *considerable saving* in gas and a welcome *reduction* in operating costs.

Always safe and dependable. No odor. Extremely durable. Delivers from the start. Six sizes—12 x 36 inches to 18 x 60 inches. Of that high quality for which WOLFF plumbing and Fixtures have been known for 67 years.

WOLFF

Makers of Quality Plumbing since 1855

Branch or Distributor at Every Central Point

Sanitary Enamelware
Range Boilers :: Brass Goods
Potteryware :: Marble

WOLFF MANUFACTURING CO. TRADE MARK CHICAGO

The presence of Wolff Quality Plumbing in a structure implies quality construction throughout

"AINSLEE"

Another Eljer Extra Value Lavatory

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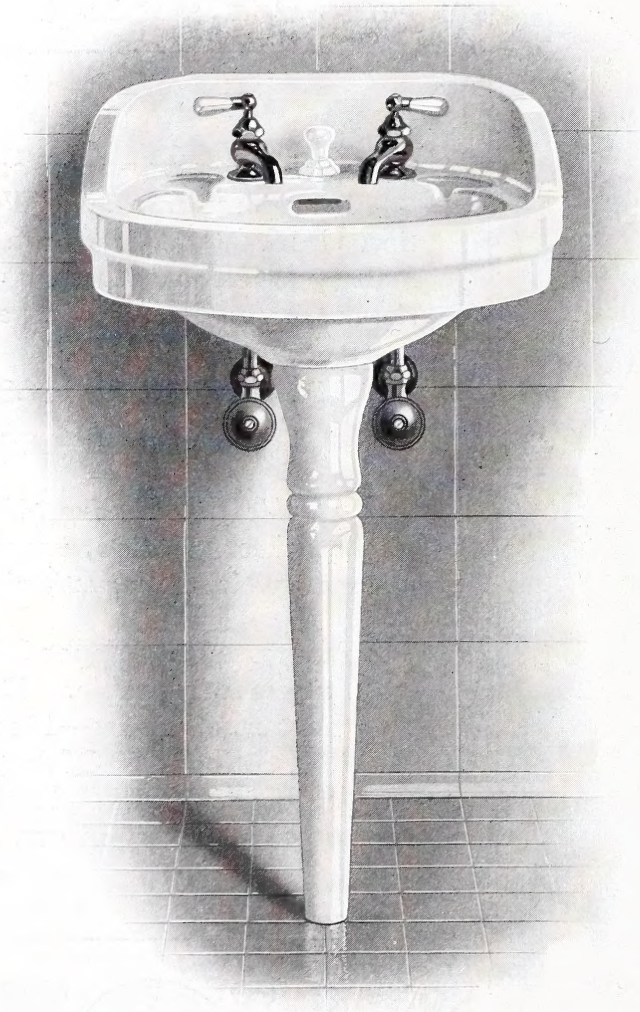
Hotels
Apartments
Offices



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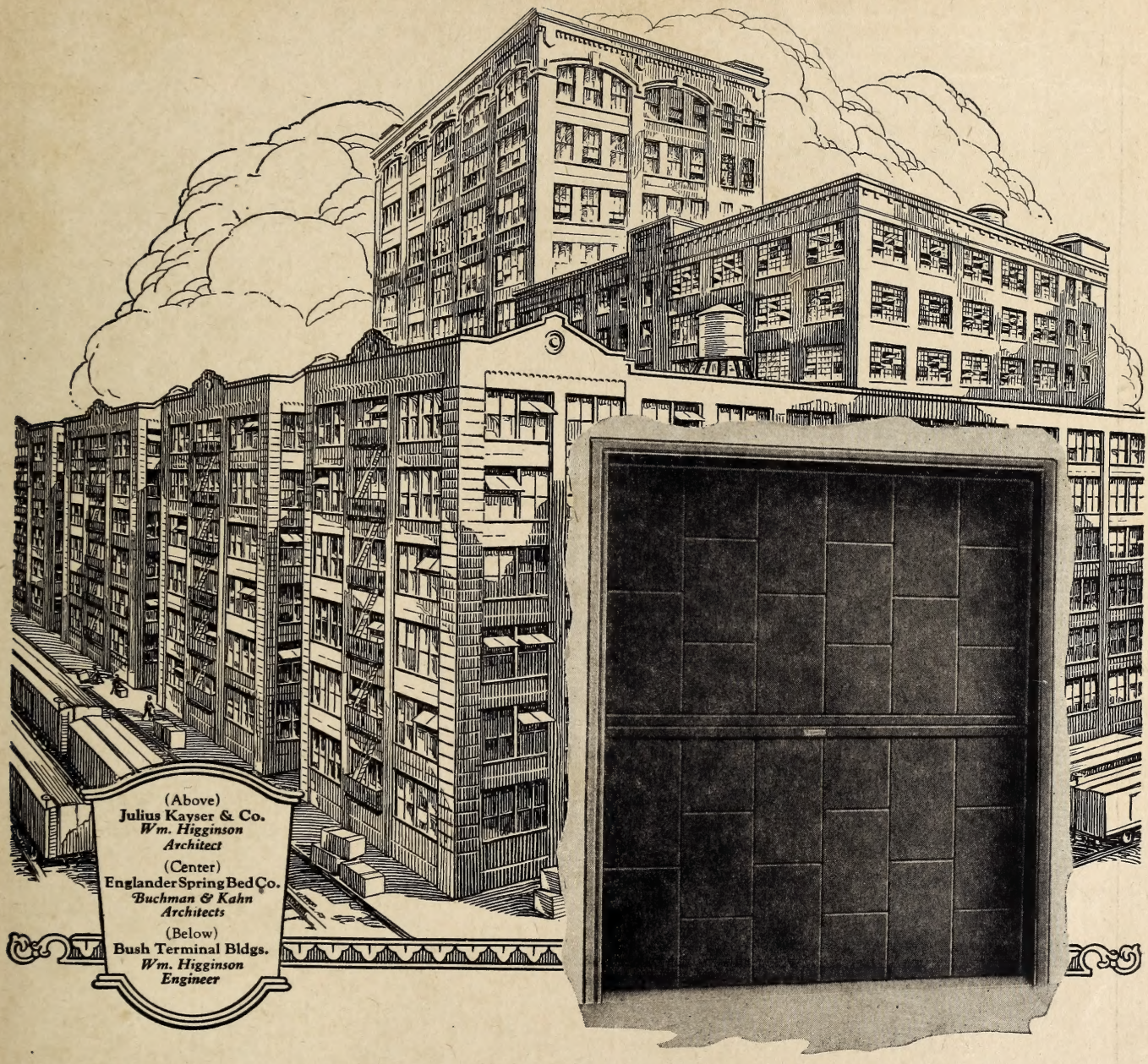

(Above)
Julius Kayser & Co.
Wm. Higginson
Architect

(Center)
Englander Spring Bed Co.
Buchman & Kahn
Architects

(Below)
Bush Terminal Bldgs.
Wm. Higginson
Engineer

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PEELLE Counterbalanced Truckable Freight Elevator Doors are efficient, not because we say so, but because we make them so. Their ability to stay "on the job" year after year, is built into them. Exacting construction insures that brand of uninterrupted, untroubled service that may be rightfully called efficient.

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